

COMPUTERWORLD

New quarterly section:
Re-engineering the workplace. Page 87

Gates offers 32-bit theatrics

Users eager for Chicago but wary of modified user interface

By Ed Scannell
LAS VEGAS

Joking that it might be a dangerous thing to do given its embryonic state, Microsoft Corp. Chairman Bill Gates gave users their first peek at the much-anticipated 32-bit version of Windows at Comdex/Fall '93 last week.

In a demonstration that proved rather safe, Gates and Brad Silverberg, leader of the Chicago development effort, gave users a quick



Microsoft's Bill Gates demonstrated Chicago's Plug-and-Play features

tour of the product's multitasking and memory management capabilities.

They also spent a fair amount of time showing off the unreleased product's support for the Plug-and-Play standard and gave a glimpse of its integrated Program and File Manager shell.

While the demonstration heartened corporate accounts looking to escape the constraints imposed by the 16-bit world of DOS and Windows, most information systems managers were left to hope Microsoft can deliver on its promises.

"I am really interested to see what sort of relief we get from Chicago. We, and I suspect many others, literally can't afford to go to NT given our current hardware

Theatrics, page 16

Network systems management

Hermes adding NetWare

By Elisabeth Horwitt

Microsoft Corp. is quietly preparing to add Novell, Inc.'s NetWare clients and servers to the roster of systems that its Hermes product will manage when it ships in the first half of next year, a product manager confirmed last week.

Hermes is the code name for a Microsoft Windows NT-based product that provides centralized software distribution and configuration management across heterogeneous systems, particularly the hundreds or thousands of desktop systems scattered across the enterprise, said Dan Shelly, group product manager for enterprise systems at the Redmond, Wash., company.

Microsoft spokespeople at Hermes briefings this fall said the product will manage the full gamut of Microsoft's Windows family but made no mention of NetWare.

NetWare management is not in the current beta version of Hermes, Shelly said.

Capabilities to come

A subsequent beta version and the initial commercial release will provide the same management capabilities for Microsoft and Novell clients and servers, Shelly said.

"We just must not have communicated [Hermes' ability to manage NetWare] effectively," he noted.

That was a big oversight, given that a majority of Fortune 1,000 information systems managers re-

Hermes, page 6



Scam artists looking for easy victims are concocting "sucker lists" of poor, elderly and other vulnerable people from commercial databases.

Management, page 77

IBM to unveil first host RAID device

By Johanna Ambrosio

■ IBM is expected to fill out its high-end storage family in the first quarter of next year with both a high-speed disk system and its first mainframe RAID device, sources said.

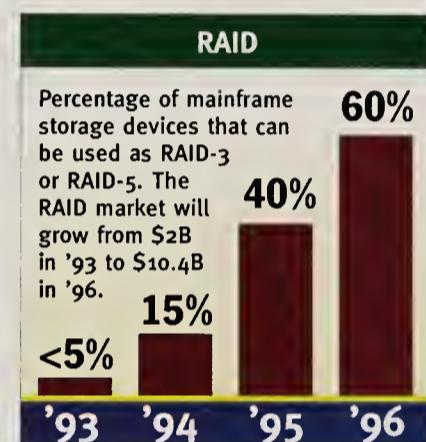
Although user reaction was mixed, analysts said IBM needs to add these to its line-up to remain even in the dog-eat-dog high-end storage market.

"IBM's entire [storage] architecture is just not as competitive as it should be," said David Vellante, an analyst at International Data Corp. in Framingham, Mass. "These are crucial to IBM."

The announcements, expected by March with general availability shortly thereafter, will allow IBM to compete on the performance front with EMC Corp.'s Symmetrix mirrored drives. EMC has shipped almost 3,000 Symmetrix units since September 1990, virtually cornering the market.

IBM may even beat Storage Technology Corp. — and that vendor's much-delayed Iceberg — to be the first vendor with a redundant arrays of inexpensive disks Level 5 device for mainframes. EMC's mainframe Symmetrix is a RAID Level 1 unit, affording some duplicate protection but not quite the

IBM, page 12



Source: International Data Corp., Framingham, Mass.

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- ▶ IBM advances networked multimedia PCs. Page 57

Workin' on the railroad

Rivals align to lay outsourcing tracks

By Mark Halper

Tired of losing miles of market share to the trucking industry, railroad companies are banding together to develop computer technology that would facilitate interrail commerce and improve delivery time and customer service.

The Association of American Railroads is seeking an outsourcer to develop computer and electronic data interchange systems that would improve communications among railroads and enhance their cargo handling and billing processes.

The railroad group has issued the first of several requests for proposals for industry-centralized computer, network and repository systems, said Randy Randazzo, vice president of technology services at the AAR.

Railroads are trying to solve a logistical

At a crossing

Railroads hope a planned EDI network will make them more competitive with truckers

REVENUE GROWTH

	Railroads	Intercity trucking
1989	\$30B	\$151B
1990	\$30.4B	\$162.3B
1991	\$30B	\$167.4B

Source: Association of American Railroads, Washington

problem. Half of all rail cargo changes lines at least once before reaching its destination, while truck cargo generally arrives with no such switch-off, according to the AAR.

Consequently, only 70% of all railroad de-

Railroad, page 14

**You Can Play Around
With Windows NT On Another
Microprocessor.**





Re-engineering the workplace

Streamlined Product Design: This week *Computerworld* introduces a new quarterly section on workplace re-engineering. The section provides a practical and detailed view of how information technology is being

Gale Zimmerman at Medtronic, Inc., maker of heart valves, pacemakers and other medical devices, is implementing process change and installing an information management system to cut time out of the design-approval process.

used to redefine and reshape business operations. This week, we take an up-close look at how product design is being transformed into a fast, flexible and information-driven activity.

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NEWS

- Novell extends NetWare services into factories, homes and even fast-food outlets. *Page 2*
- Microsoft reconsiders and joins Digital to offer technology that will make OLE Corba-compliant. *Page 2*
- CA is threatened with breach-of-contract lawsuit by small developer. *Page 4*
- Major network management vendors embrace Windows NT and Hermes. *Page 6*
- British Aerospace selects CSC over EDS after a yearlong outsourcing evaluation. *Page 12*
- Duke Power embarks on companywide re-engineering and downsizing projects. *Page 14*
- Texas Utilities taps ISSC for PC and LAN services. *Page 15*
- IBM apologizes to customers and dealers for delivery problems. *Page 16*



DESKTOP COMPUTING

- Word 6.0 excels at "ease of use." *Page 37*

WORKGROUP COMPUTING

- Uniplex adds support for Windows clients, E-mail and remote access to its office automation package. *Page 47*

ENTERPRISE NETWORKING

- Enterprisewide conferencing should benefit from multimedia products introduced at Comdex. *Page 57*

LARGE SYSTEMS

- Sun markets internal systems management tools. *Page 63*

APPLICATION DEVELOPMENT

- Borland and Microsoft are vying to assist developers working on Windows and OLE applications. *Page 69*

MANAGEMENT

- **Unscrupulous marketers** are sifting through commercial databases to target vulnerable segments of the population. *Page 77*

IN DEPTH

- If you like roller coasters, you'd love massively parallel processing. Some sites have as many as 15 crashes a day. *Page 97*

COMPUTER CAREERS

- The quest for widespread direct access to business data is creating new career opportunities for IS professionals. *Page 103*

MARKETPLACE

- **Upgrade inflation.** When you factor in upgrades, the price of a PC package can triple in five years. *Page 111*

COMPUTER INDUSTRY

- Relational database vendors threaten already struggling object-oriented database suppliers. *Page 119*

COMMENTARY

- We're getting a lot closer to the day when we'll be able to perform complex searches on massive databases, says Charles Babcock. *Page 6*

- While leading vendors engage in semantics about openness, writes Bill Laberis, users are finding they have little choice except to pick one brand and stick with it. *Page 32*

- Top corporate executives often know shockingly little about their information systems investments, writes Rebecca Bailin. *Page 33*

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Executive Briefing

Technology-enabled teamwork is the goal for many businesses trying to beat back competition and ensure profitability in lean times. Railroads are looking for computer and EDI systems that will help them collaborate more effectively against truck transport. *Page 1* Many companies are also turning to information technology to pull product design into closer collaboration with marketing and manufacturing. *Page 87*

Increased interest in privacy and security of computerized data is a safe bet. Public and governmental concern is already rising about protection of sensitive medical data under a health care reform plan involving computerized transfer of massive volumes of patient data. Although President Clinton's proposal calls for enactment of strong privacy legislation, privacy advocates say laws should come much sooner. *Page 63* Another emerging concern: An increase in direct marketing scams aimed at vulnerable individuals, whose names are "filtered" from commercial databases using high-tech search tools. *Page 77*



"Never again will we use technology to price products higher."
—*Page 29*

MICHAEL SPINDLER, CEO, APPLE COMPUTER, INC.

Wireless reaches adolescence. The consensus of customers at Comdex seemed to be that the technology is coming of age and you don't have to be a daredevil to begin experimenting with it. American Airlines is slated to begin piloting wireless Sabre terminals and Cellular Digital Packet Data links by the end of this month. And a member-owned network services supplier to the insurance industry is readying a pilot wireless network for claims adjusters. *Page 25*

Wider on-ramp, cheaper toll for Internet. Basic-rate ISDN access to the Internet is now offered in 30 cities for \$400 per month. This may be a cheaper alternative for some companies than paying for dedicated lines for sporadic use. *Page 57*

Multimedia: Lots of products in search of a market. The showfloors of Comdex were full of multimedia offerings. IBM software debuted that lets users of OS/2 2.1 capture images off regular video equipment and then edit it into other software. Peregrine Systems announced software it says will give Windows users desktop videoconferencing and the ability to share live information through on-screen display. *Page 57*

A possible fly in the soup is software publisher Compton's NewMedia's recently announced attempt to patent a core technology used in thousands of multimedia applications.

HOW TO CONTACT COMPUTERWORLD EDITORIAL:

PHONE:	FAX:
Main office, Framingham, Mass.	(508) 879-0700 (508) 875-8931
24-hour tip line	(508) 820-8555
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090 (201) 712-1808
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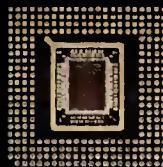
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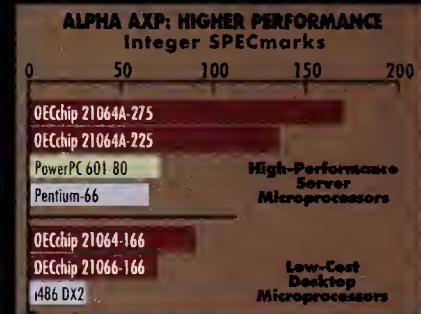
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work

digital

Pact to heal division over objects

By Melinda-Carol Ballou

■ Microsoft Corp. next week is expected to announce technology developed by Digital Equipment Corp. and others that will enable Object Linking and Embedding (OLE) 2.0 to comply with the Common Object Request Broker Architecture (Corba) standard from the Object Management Group (OMG), according to sources close to both companies.

The announcement of the technology, said to bridge the chasm between these two key, emerging object-oriented standards, is timed to coincide with the OMG's request for proposals for the Corba 2 interoperability standard. It will be submitted by the companies to the OMG early next month, the sources said. The technology and tools supporting it are expected to ship by late 1994.

Separately, Microsoft has been participating in discussions with IBM, Candle Corp., Sun Microsystems, Inc. and others to offer interoperability between IBM's Distributed System Object Management (DSOM), SOM and OLE, sources said.

This will also be offered to the OMG for Corba 2.

Lack of compatibility between OLE and Corba would ultimately have meant a struggle for developers and end users as the industry moves toward object-oriented operating environments, according to industry analysts.

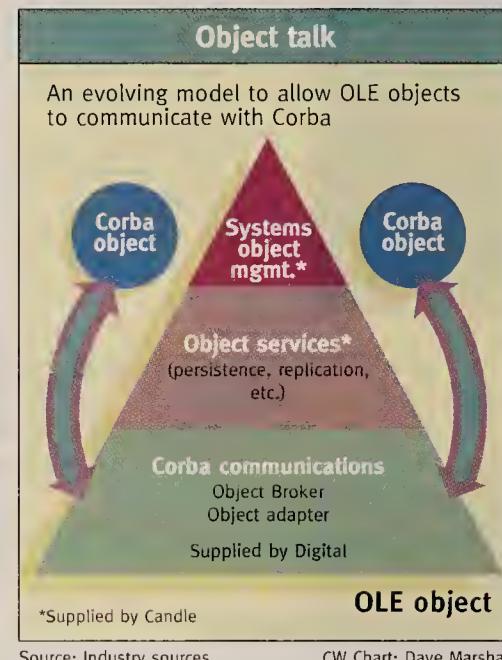
"People will care ultimately, even if they don't know that they care today," said Adrian Bowles, managing director at Atelier Research in Westport, Conn.

The Digital technology could eventually offer total interoperability between OLE and Corba, according to one source familiar with its inner workings. "I could be working in Word writing a proposal and need to get information about bills and materials down from the server. I would be able to open an OLE object, link the data down and the server won't have to understand OLE. It will handle it as a Corba request," the source said.

Corba has been adopted by major systems vendors other than Microsoft as the standard traffic cop technology for enabling objects to communicate with one another. OLE, meanwhile, has increased

ubiquity in the behemoth Windows marketplace and will pave the road to Cairo, Microsoft's object-oriented environment due out in 1995.

As part of an alliance with Microsoft, Digital will supply technology that will allow OLE to retain its own object model



but will manage and reconcile differences between OLE and Corba, the sources said.

The technology will include an object adapter from Digital, which will transform the OLE object into a Corba object or vice versa, sources said. Digital's ObjectBroker gateway will send and deliver messages between OLE and Corba, they added.

Also included will be object systems management and object services from Candle in Santa Monica, Calif., sources said (see chart).

Microsoft's Chief Executive Officer Bill Gates indicated at the Seybold Office Computing Conference last month that his company would reverse an earlier stance opposed to such an accommodation between OLE and Corba. Microsoft, Digital, Candle and OMG officials refused to comment on the upcoming announcement.

Some analysts were skeptical about the expected technology, however.

"These are two different architectures, and we're going to have to see how robust the interoperability can be between them," said John Rymer, an analyst at Patricia Seybold Office Computing Group, a consulting firm in Boston.

NetWare everywhere — if Novell can pull it off

By Elisabeth Horwitt

Novell, Inc. is looking to extend NetWare's franchise into applications far removed from its traditional network operating system turf — such as the factory floor, fast-food outlets, consumer electronics, office equipment and environmental systems.

Novell's Extended Networks Group plans to announce by January an architecture for delivering NetWare services over a "broadband information highway" to disparate environments (see chart), said Daryl McBride, vice president and general manager of the Monterey, Calif., group.

The devices to be linked into NetWare will include factory machinery, refrigeration and cooking equipment in fast-food chains, point-of-sale (POS) systems, environmental and security systems and office equipment such as faxes and copiers, Novell said. Such devices, which tend to be proprietary and only semi-intelligent, will be prepared to receive NetWare services through embedded client software, scaled-down operating systems and network boards, McBride said.

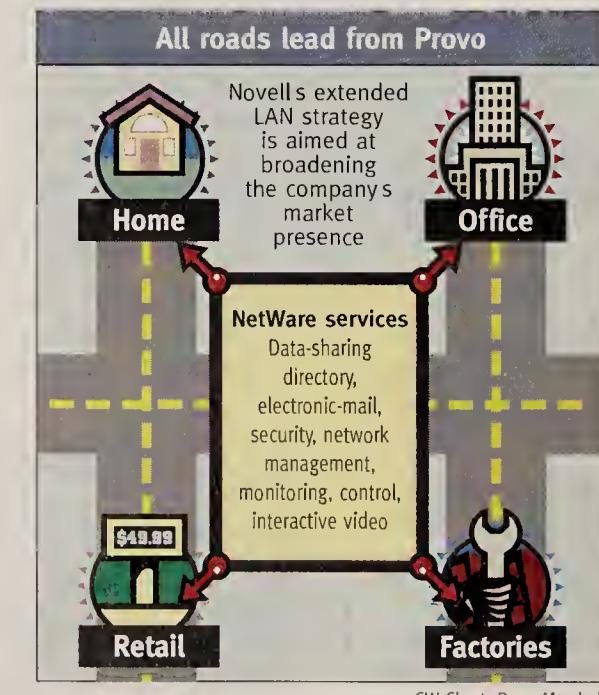
The group's overall goal is for NetWare to assist efforts by retailers and manufacturers to gain control of and views into the processes occurring at factories and retail outlets, he explained.

Novell's Extended Networks Group's strategy is partly a response to Microsoft Corp.'s Microsoft at Work initiative but is critical if Novell is to maintain healthy revenue growth, analysts said.

Retailing and manufacturing are potentially fruitful industry segments for Novell, which has "penetrated [them] somewhat"

in the back office "but not to the floor," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington.

Several users and analysts in the retailing and manufacturing sectors expressed a strong interest in what Novell is promising. However, even McBride agreed that the



vendor has a tough row to hoe to achieve consensus in industry areas that are even more fragmented and proprietary than today's business computing market.

McDonald's Corp. is one company that Novell has approached to be a beta site for the Extended Networks architecture. "We think [Extended Networks] is more than interesting; we're just not sure how to apply

it yet," said Chuck Rush, systems project manager at the Oak Brook, Ill., company.

McDonald's is in the initial stages of a project to network its in-store systems so that "based on historic sales data and forecasting and time of day, you could [remotely] start the fry machine," Rush said.

In the retailing environment, at least, Novell is the No. 1 LAN supplier on the office side and is in a good position to shoehorn its way into store automation, said Tom Friedman, editor of "Retail Systems Alert," a newsletter in Newton, Mass. Several vendors now offer systems to poll retail POS devices, but Novell can add value by providing a way to collect and integrate data from disparate devices in a secured and reliable manner, Friedman said.

Indeed, NetWare network management and security services are a major reason why Friendly Ice Cream Corp. is now looking to use NetWare to send information between its shops and the headquarters data center, said Bob Laprade, senior systems programmer at the Wilbraham, Mass.-based restaurant chain.

In the manufacturing sector, Novell is looking to provide a standard architecture by which companies can monitor factory floor equipment and collect data to be fed into business systems, such as manufacturing resource planning, McBride said.

Hoechst Celanese Corp., a chemical manufacturer, would be interested in NetWare as a low-cost way to tie different areas together, as long as Novell could provide the real-time operating system to ensure real-time communications, said project leader Lorie Moukias. A symmetrical multiprocessing version of UnixWare would be a strong candidate, he added.

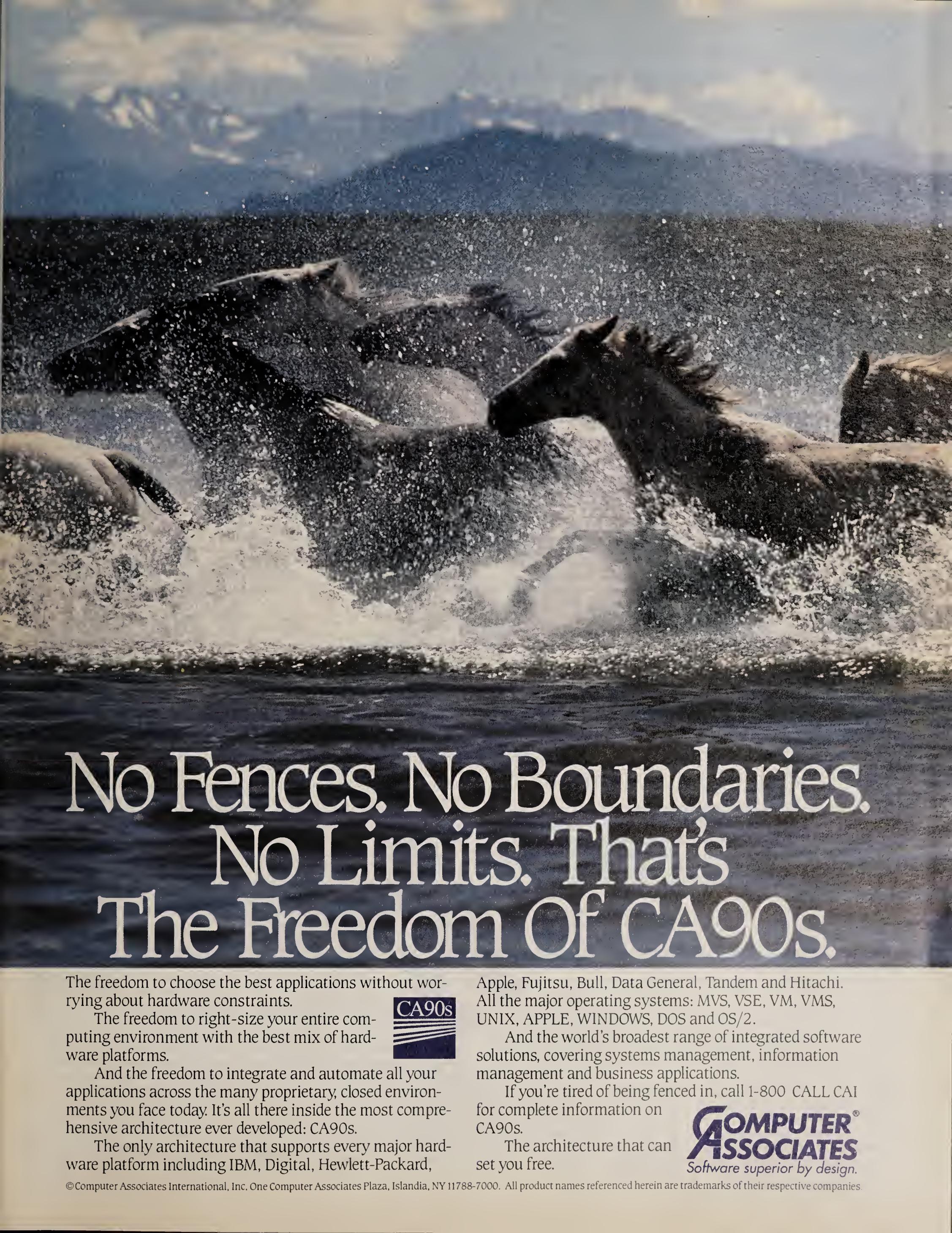
NetWare certification tips, page 104

Stretch the net

Novell is employing the following tactics to extend NetWare into new business:

- Allying with dominant equipment and network vendors in target industries to make their products NetWare-compliant.
- Embedding scaled-down NetWare, UnixWare and Novell's FlexOS real-time operating system in devices.
- Using standards such as the Desktop Management Task Force's Desktop Management Interface and Simple Network Management Protocol, which enable a central system to collect a variety of statistics from networked devices.
- Bringing NetWare intelligence to semi-intelligent devices via third parties. Two of the third parties are likely to be Geoworks, which recently partnered with Novell to embed NetWare in personal digital assistants and other mobile devices. Its Geos "small footprint" operating system can be cheaply added to office devices; and Echelon Corp., which offers a network processor and peer-to-peer networking software embedded in factory floor, environmental, building and retail systems.

—Elisabeth Horwitt



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Supercomputing '93

Vendors see the MPP light

By Ellis Booker
PORTLAND, ORE.

The commercial market appears primed to embrace high-performance computing architectures — especially massively parallel processor (MPP) systems — as tools that can solve real-world business problems ranging from SQL queries against gargantuan customer databases to video-on-demand services over the information highway.

At least that was the take of observers attending Supercomputing '93 last week, which was replete with the fruit of efforts by supercomputing vendors that have been polishing their products and business strategies for the past year in an attempt to appeal to a broad commercial market.

"Look, I like knowing the mass of a proton and watching galaxies collide.... But I'd much rather see Boeing be able to beat Airbus," said James R. Kasdorf, director of supercomputing at Westinghouse Electric Corp. in Pittsburgh.

Kasdorf said dependable MPP machines suitable for the production applications found in the industry have only recently appeared. "The vendors just didn't know what was required for production-quality system software," he said.

Jeff Canin, a research analyst at Salomon Brothers, Inc. in San Francisco, agreed, although he warned that the MPP market,

which is now at about \$300 million, "is only half what conventional wisdom was predicting it would be five years ago."

Thus, Canin estimated that serious use of MPP architectures for decision-support systems and online transaction processing is still three years away. In the interim,

(Cray also revealed that his own next-generation supercomputer would mix MPP and vector computing, although he declined to say when the platform would be available.)

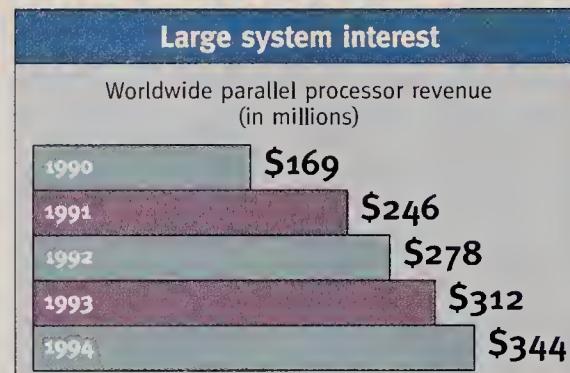
Meanwhile, price/performance of supercomputers has improved spectacularly during the past several years. Larry Smarr, director of the National Center for Supercomputing Applications at the University of Illinois, said the price per million floating-point operations per hour has fallen by a factor of 100 during the period, from approximately \$5 in 1985 to 5 cents today on the

center's CM-5 from Thinking Machines, Inc.

Others noted that technologists' debates about raw processing power are less important to commercial customers. "Price/performance is only 30% [of the sale]," said new President and CEO John M. Harte of MasPar Computer Corp. in Sunnyvale, Calif.

Equally or more important to these customers is the support of interfaces, integration, standards and peripherals, he said.

Even so, vendors, when pressed, rein in their excitement about the commercial market and its opportunities. IBM executives, for instance, acknowledge that the first



Source: International Data Corp., Framingham, Mass.

he said, it will be critical for MPP vendors to find "unique applications and niches."

Find a niche

This approach was endorsed by none other than the supercomputing industry's most senior executive and pioneer, Seymour Cray, founder of Cray Research, Inc. and current president and chief executive officer of Cray Computer Corp. in Colorado Springs.

During a rare, informal conversation at Supercomputing '93, Cray somewhat chided MPP vendors for "trying to be all things to all people." A better approach is to find niches and fill them, he said.

sales of their IBM Scalable Power Parallel Systems 9076 SP1, which became generally available in September, will go into the technical/scientific realm first.

"But we'll be making sales to our first commercial customers on Wall Street and a UK retailer in December," said Ben C. Barnes, assistant general manager of IBM's Power Parallel Systems in Somers, N.Y. Both of these customers will be running Oracle Corp.'s parallel database engine, Barnes said.

Big attraction

Supercomputing '93, sponsored by the Association for Computing Machinery and the IEEE, saw attendance edge up to more than 5,000 from 4,650 a year ago. In 1988, the show attracted just 1,400 attendees.

High-performance wares

Announcements of note at Supercomputing '93 included the following:

- Showcasing the promise of the "information highway," the National Information Infrastructure Testbed unveiled its first application for a wide-area, interactive multimedia network.

Called Earth Data System, the interactive multimedia application was linked across nine U.S. sites with Asynchronous Transfer Mode, Fiber Distributed Data Interface and frame-relay networks. Researchers in any of the locations could access data and images about Earth's weather and environment.

• High Performance Parallel Interface (Hippi) was hot at the show. MasPar Computer, Hewlett-Packard Co., Broadband Communications Products, Inc. and Essential Communications announced products adhering to the 800M bit/sec. ANSI interface standard.

• Network Systems Corp. demonstrated its Hippi-over-Sonet (Synchronous Optical Network) gateway product. Intel Corp. said it would market Hippi-attached storage servers from Maximum Strategy, Inc.

• Thinking Machines Corp. announced a new generation of parallel processing nodes for its CM-5 MPP platform.

Suit questions CA code use

By Thomas Hoffman

■ Opening arguments in a breach-of-contract lawsuit filed by a small Vermont software developer against Computer Associates International, Inc. are set for January, and the action could have major ramifications for the Islandia, N.Y., software giant.

At stake are millions of dollars in international revenue and profits accrued during the past six years from the sale of nearly 90 CA programs, including CA-Unicenter, CA-Top Secret and CA-SuperProject. Reliability Research, Inc. in Salisbury, Vt., claims CA must pay for the right to use and market technology gained when the latter acquired University Computing Co. in August 1987.

Thomas Wilinsky, an associate at Leventhal Slade & Krantz, a New York law firm representing Reliability Research, said his client had been attempting to settle its claim with the vendor for a number of years before finally filing suit.

A CA spokesman said Reliability Research's claims "are totally without foundation" and that the company is vigorously defending itself. He added that "CA's policy is not to comment on the specifics of pending litigation."

Legal pundits familiar with the suit said Reliability Research has a valid case, though they were unsure whether it has a legitimate claim against all 90 CA software programs.

"Obviously, nobody's laughing them out of court," said Ron Abramson, intellectual property counsel at Hughes, Hubbard & Reed, a prominent New York law firm.

Suit's origin

The lawsuit, filed in U.S. District Court in New York in 1991, stems from a 1979 licensing and marketing agreement between University Computing and Reliability Research under which the latter

granted the former an exclusive 99-year license to market and distribute Reliability Plus — a program that was designed to monitor, analyze and report on computer hardware failures — in the U.S. and Canada.

In 1984, the agreement was modified, stipulating that University Computing and Reliability Research were honor-bound to notify each other of any "product improvement or other offerings in the area of computer reliability."

University Computing was required to request a waiver for any computer reliability-designated products it sold. This agreement, Reliability Research contends, extended beyond

University Computing products that used its technology to any systems management products University Computing developed and marketed.

In the absence of a waiver, the software in question would become the sole and exclusive property of Reliability Research, which would then be entitled to all non-North American revenue and

profits University Computing earned from those products.

When CA acquired University Computing, it assumed all of the company's rights and obligations, including the 1984 licensing and marketing agreement, Reliability Research claims. Reliability Research also contends that CA has marketed nearly 90 products offering computer reliability since its acquisition of University Computing.

Payback time

The developer further claims that since CA has not honored the University Computing agreement, the \$1.8 billion software giant owes Reliability Research at least \$5 million in non-North American profits and revenue.

Wilinsky said \$5 million is the minimum amount of damages the company is seeking. He added that the law firm's accountants were trying to determine what the maximum damages could be.

Wilinsky said his firm has had occasional settlement talks with CA but declined to elaborate further. Wilinsky did not rule out a settlement before — or even during — the jury trial.



Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."

ORACLE7

■ **2 hours**

SYBASE



12 hrs.

IBM DB/2

17 hrs.

INFORMIX

36 hrs.



LOAD AND INDEX

"Oracle7 finished the entire test suite in less time than most took just to load and index our data."

PC Magazine

ORACLE7

■ **47 minutes**

IBM DB/2



154 min.

INFORMIX

154 min.

SYBASE

159 min.

AD HOC QUERY

"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

PC Magazine

ORACLE7

■ **47 seconds**

IBM DB/2



636 sec.

SYBASE

657 sec.

INFORMIX

759 sec.

CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

ORACLE7

■ **44 seconds**

SYBASE



660 sec.

IBM DB/2

698 sec.

INFORMIX

759 sec.

CONCURRENT RANDOM READ

"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine "Only after days and days of repeated crashes were we able to obtain a full set of results."

Ingres Server "...we would not recommend it because of the showstopping multi-user bug we encountered."

Gupta SQLBase "...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."

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A world of records is a moment away

We are rapidly moving closer to creating systems that treat objects like other forms of data. When such systems do exist, it will become routine to launch spur-of-the-moment queries against complex data types. That might not sound like much, but when this advance comes about, many of the hidden constraints on the power of computing will begin to drop away. Whether we acknowledge it or not, we still deal with data in superficial ways, accepting our manacles because "the system" can't get around them.

There's little doubt a database of X-rays would help an oncologist if he could search for tumors similar to the one he was treating. The most relevant X-rays, however, would be those of tumors that not only had been prearranged by medical classification but also were a match in size and shape. Furthermore, if the doctor found the related patterns, he would then want to know what therapies had been used and which were the most successful.

This combination is beyond the capability of present-day systems. If one compiles a database of images, it is difficult to search for physical patterns without a specialized neural network. If one can search for patterns, then it is difficult to relate the pattern to other forms of complex data or do an ad hoc query to discover developing trends.

Small databases might yield records that could be sorted by hand, but a national database would have hundreds of thousands of records. If we could use computers to search large, complex databases, they would yield hard-won knowledge that lies hidden in their underlying patterns.

Today's object-oriented systems can store and retrieve complex data, but the way they access the data is determined at the time the database is organized. We can't do impromptu queries against them.

Current relational systems can do ad hoc queries, but they only deal with a few simple data types. Getting relational databases to deal with date/time stamps was considered a big advance in the last revision of SQL.

I say we are rapidly moving toward unlocking these shackles because fresh work is going into developing the key. Some of the research has been done by Michael Stonebreaker in his Postgres project at the University of California at Berkeley. Stonebreaker was one of the founders of Ingres. Other work has been done by Won Kim, who generated a relational-like system for objects at Microelectronics Computer Corp.

Stonebreaker and Kim have received venture capital backing to start companies that capitalize on their insights. Stonebreaker's Montage Software, Inc. in Emeryville, Calif., and Kim's UniSQL, Inc. in Austin, Texas, have launched object-based systems that respond to ad hoc SQL queries.

At Science Applications International Corp. in San Diego, Jean Anderson, database manager at the open systems division, has implemented Montage and says, "We feel we've got the best of both worlds."

In Houston, Petrotechnical Open Software Corp., a technology sharing consortium comprising Chevron, Texaco, Mobil and others, is about to release a set of interfaces it developed that allow UniSQL (and a hybrid object system, OpenODB from Hewlett-Packard) to work alongside DB2 and other relational systems. Once in place, this amalgamated system will allow the oil companies to do things that Leon Karcher, director of operations, says are "not imaginable with relational engines" — things such as searching their seismic data on an ad hoc basis, looking for patterns that indicate subterranean oil reservoirs.

Babcock is Computerworld's technical editor. His MCI Mail address is 575-2737.

The Meta View



We are about to gain the ability to search large, complex databases, unleashing one of the hidden powers of computing.

Charles Babcock

Vendors plan support for Hermes, NT

By Lynda Radosevich
LAS VEGAS

Microsoft Corp.'s Windows NT and its desktop management application (code-named Hermes) received broad support from the network management world last week as major vendors released details on how their platforms will embrace them.

Key announcements regarding support plans came from IBM, Digital Equipment Corp. and Hewlett-Packard Co. [CW, Nov. 15]. Additionally, Cabletron Systems, Inc. said it is porting its Spectrum for Open Systems network management software to NT, and Siemens Nixdorf Information Systems, Inc. demonstrated at Comdex/Fall '93 its Transview-SNMP network management system, which accesses desktop computers via an NT server using the Desktop Management Interface standard.

"The Hermes capability is very attractive because it gives us the ability to manage down to the desktop, and that is vital for the future," said HP OpenView user Rick Sturm, a member of the technical staff at US West Advanced Technologies, Inc. in Boulder, Colo.

"Right now, one group manager looks after

the network, another monitors PC hardware and software and another takes care of the file servers," said a senior systems programmer at a major consumer products company in Oakland, Calif., who asked not to be identified. After viewing a Hermes and an IBM NetView/6000 demonstration, he said the combination held promise for centralizing the operations.

IBM, Digital and Microsoft said Hermes will be able to send desktop topology and status information to all NetView/6000 releases. In August, Digital licensed NetView/6000 to port to its Alpha-based systems running OSF/1 as part of its Polycenter network management platform.

Last week, Digital said it will port NetView/6000 and Hermes links to DEC OpenVMS and NT. Hermes will also support OS/2 and DOS desktops and Novell servers at an as-yet unspecified date (see story cover 1).

Meanwhile, HP said it will port OpenView to NT for Intel Corp. machines in the first half of 1994. HP also said its now-incompatible PC- and Unix-based OpenView management consoles and the upcoming NT-based OpenView will be fully interoperable by the end of 1994. Integration with the Hermes application is scheduled for the second half of 1994.

Hermes

CONTINUED FROM COVER 1

cently interviewed by Forrester Research, Inc. said their biggest problems in managing heterogeneous client/server systems lay in getting a grip on what is actually out there and then being able to distribute software across the enterprise.

"I said [to Microsoft], 'OK, I've got Windows clients, NetWare servers and database server operating systems. What do I buy to manage them all?'" said Janet Hyland, a senior consultant at the Cambridge, Mass., research firm. If Microsoft does not address such heterogeneous systems with Hermes, users are likely to go to Novell's NetWare Distributed Management System (NDMS), Hyland said.

NDMS can already manage NT via the Simple Network Management Protocol (SNMP) and will be able to collect information from NT systems via the Desktop Management Task Force's Desktop Management Interface protocol, according to Novell product line manager Steve Dauber. However, he did not say NDMS would work directly with NT management utilities, as Hermes does.

The ability to manage NetWare as well as Windows systems will make Hermes a very powerful management product, particularly in concert with Hewlett-Packard Co.'s OpenView, which provides the Unix management component, said Frank Belland, senior communications consultant at Martin Marietta Corp.

HP and Microsoft announced plans last week to integrate Hermes with OpenView (see story above). HP has positioned OpenView as an enterprise manager that tracks networks and networked systems across the corporation.

Integration between Hermes and OpenView would allow network administrators to do software distribution and metering without "needing to use a Unix tool, then a DOS/Windows tool and then a Novell tool," Belland said.

Hermes will distribute software updates and

batch files to both NT and NetWare clients by programming the server to download the files as a preset time, Shelly said.

However, Hermes does not provide real-time diagnostics and monitoring of either Microsoft or Novell systems, Shelly said. Microsoft provides real-time management of NT systems via a Windows console through utilities embedded in NT. And the company will provide integration of NT management with management of other systems through third-party enterprise management systems such as OpenView, which manages NetWare through software provided by its partner, Peregrine Systems, Inc.

Hermes management of Microsoft and Novell clients and servers will include the ability to collect configuration information, such as disk utilization and which peripherals, hardware

Systems management pain points

Hermes addresses IS managers' top 2 headaches in networked systems management, according to 50 Fortune 1,000 companies surveyed



Source: Forrester Research, Inc., Cambridge, Mass.

and software components and applications are installed, Shelly said.

Hermes' primary function will be able to communicate with Novell systems via either Novell's IPX protocol or TCP/IP, Shelly said.

Microsoft would not give technical details on how Hermes will interact with NetWare to accomplish this. One likely scenario, however, is for Hermes to collect information from NetWare using standards supported by both firms, including SNMP, Desktop Management Interface and the Internet Engineering Task Force's Host Management Information Base, Belland said.

Digital license manager stays in limbo

By Craig Stedman

Digital Equipment Corp. is close to completing development of a software license manager that supports Microsoft Corp.'s Windows NT operating system, but plans for marketing the product still hinge on the signing of a long-delayed agreement under which Microsoft would offer it with NT.

Digital expects to get Microsoft on board in June and then immediately introduce the Polycenter Licensing System (PLS) technology [CW, June 28]. However, both the deal and the introduction have been held up following management changes within the Windows NT organization at Microsoft during the past few months, according to sources familiar with the PLS strategy.

PLS, code-named Omni, would ensure that client PCs are licensed to run specific applications. Software vendors could thus be assured that their programs are being used properly, while users would have the potential to electronically track licenses and monitor software use.

Limited appeal

Digital is taking a programmable, object-oriented approach with Omni that differs from the existing menu-driven license managers made by Gradient Technologies, Inc. and others, analysts said. But Digital executives describe deals of this sort with Microsoft as prerequisites to bringing Omni to market.

"A proprietary licensing system is of no use to anybody," said Dennis Biedrzycki, marketing manager for Digital's Polycenter line of network and system management products.

Bob Koskovich, information services manager at EDM Supplies, Inc., a distributor of electrical equipment in Downey, Calif., agreed that Omni would not have much appeal unless other companies embrace it.

"If we have some vendor buy-in more than Digital, the technology looks very promising," said Koskovich, who attended an Omni customer briefing last spring. "It looks like it would make life a lot easier, but if just Digital is using it, then that's not enough."

Robert Fowkes, business development manager for corporate business practices at Digital, said scrapping Omni has been "an option if we couldn't come to an agreement" with a key company, which sources close to Digital identified as Microsoft. He said he hopes to have a deal in hand "in a couple of weeks," but noted that Digital has viewed the deal as "days away" ever since June.

A Microsoft spokesman would not comment on the discussions with Digital over Omni. He said Microsoft will provide license management capabilities with Windows NT, probably as a set of system services, but added that the company is not ruling out an internal project.

Microsoft's Hermes systems management product, now under development for use with NT, will keep track of inventories of software licenses, but Microsoft officials have said it will not handle license management. They added that Hermes will eventually be able to query license managers (see story cover 1).

Andrew Dailey, an analyst at Gartner

Group, Inc., a consulting firm in Stamford, Conn., said Digital's ability to market Omni against rival license managers from Gradient and other vendors is becoming "exponentially more difficult with each day that passes."

Dailey added that continued uncertainty over Omni could also hinder a series of software asset management ser-

vices and products that Digital is now marketing. License and asset management can stand apart from each other, but combining them makes for a "much more potent" offering, Dailey said.

Biedrzycki noted that Digital may end up supporting multiple license managers with the asset management portfolio. "Quite frankly, if [PLS] is not widely accepted, you have to go with whatever [licensing] systems are being used by all the application vendors," he said.

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Operating systems

Solaris' Intel support lags behind SPARC

By Jean S. Bozman

MOUNTAIN VIEW, CALIF.

Even as SunSoft, Inc. continued last week to push its vision of the Solaris operating system as a Unix alternative for Intel Corp. PCs, the company confirmed

that the X86 version will continue to run two releases behind the one for Sun Microsystems, Inc.'s SPARC-based workstations for at least several months.

The two Solaris releases will "sync up" in the spring, possibly as soon as April, said Jim Billmaier, SunSoft's vice presi-

dent of product marketing.

"Solaris 2.3 started shipping last week," he said, adding that a common version of 2.x code would run on both SPARC- and Intel-based machines "in the first half of next year." From then on, he said, "everything we do will be released

on SPARC and Intel simultaneously."

Until then, industry analysts said PC users will have to use Solaris 2.1 on their PCs. The Solaris X86 has limited multiprocessor support for certain machines, they said. It also lacks direct connections to Novell, Inc. NetWare LANs. Instead, users need to use Sun's PC-NFS software to connect to NetWare servers.

At the same time, Sun may be cautious about competing with its own line of SPARC workstations, said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

"The Intel Pentium is running deep into their space in terms of performance — where their SuperSPARC is running today," Iams said. "They could potentially be competing with their own workstations."

Faster 64-bit UltraSPARC machines are due from Sun next year, he noted.

When the synced version arrives — called either Solaris 2.3.x or Solaris 2.4 — it will offer support for Solaris Live videoconferencing software and multimedia tools, Billmaier said.

Making it fit

SunSoft held a user roundtable here last week to explain how the PC version of Solaris would fit with large corporations' moves to Sun servers. During the discussion, users said a corporation's move to Solaris begs the question of PC compatibility. Analysts said Sun had to offer Solaris X86, plus the Wabi interface for Microsoft Corp. Windows compatibility, to address the concern that Sun was not playing in the PC space.

To expand its X86 market for Solaris, SunSoft made an agreement with Unisys Corp. to resell Solaris X86 on the Unisys U 6000 series of Intel-based machines.

"We're offering it on the uniprocessor systems to begin with," a Unisys spokesman said. Solaris X86 will run on three models: a desktop 486, a deskside server and a Pentium-based uniprocessor server. Unisys said it will continue to offer UnixWare and Unix System V, Release 4 from Novell for the U 6000 line.

SunSoft said it had made an agreement with Locus Computing Corp. to support Locus' Merge PC on the X86 and systems from Interactive Unix, a firm Sun acquired. At Comdex/Fall '93, SunSoft demonstrated Solaris software running on IBM's Power Personal computers, which are based on IBM's PowerPC chip.

SPARC vs. X86

The biggest difference between the X86 and SPARC versions is byte-ordering, with SPARC's "big" endian and Intel's "little" endian, analysts said. Applications and data must be translated for binary compatibility, but the process can be masked. SPARC has multiprocessor support, more Posix support and higher performance. The PC version has to support a wider array of peripherals and devices, said John Morrell, a Unix analyst at International Data Corp.



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News Shorts

Gates offers NT direction

In addition to talking up Chicago at Comdex, Microsoft Corp. Chairman Bill Gates elaborated on a promised major update for Windows NT next year. The update will feature improved file server performance in a bid to match Novell, Inc.'s NetWare and a slightly smaller memory size requirement to give NT an edge over Unix in the technical workstation market. Gates also said Microsoft will modify the Windows interface on NT to match the new interface under development in Chicago (see story on cover 1).

Hacker breaks into Internet branch

A computer intruder last week breached security in the Bay Area Regional Research network (BARRnet), a major branch of the Internet in Northern California. The person was trying to steal passwords that would permit him to access other linked networks, according to BARRnet officials. BARRnet subscribers have been advised to change their passwords while the hunt for the hacker goes on.

IBM object standard gets support

IBM's Systems Object Model (SOM) and Distributed Systems Object Model (DSOM) got a significant boost last week when five suppliers of object-oriented tools said they have licensed and will integrate the technologies into a range of different products. The companies include MetaWare, Inc., which said it has already shipped to beta sites its High C/C++ compilers for IBM's AIX/6000 and OS/2 2.1 operating systems that include DirectToSOM support for IBM's SOM and workstation DSOM. The other four companies include ParcPlace Systems, Inc., Digitalk, Inc., Watcom International Corp. and Objective, Inc.

Met Life IS chief moves on

Bruce J. Goodman, formerly senior vice president of corporate information systems and chief information officer at Metropolitan Life Insurance Co. in New York, has joined The Prudential Insurance Co. of America in Newark, N.J., as president of its newly formed Prudential Business Systems Unit. In his new post, Goodman will be responsible for re-engineering the individual insurance units' core systems.

Phoenix will Plug-and-Play

Phoenix Technologies Ltd. has signed a deal to develop and license to Microsoft Corp. a key piece of technology that supports the Plug-and-Play BIOS in an operating system. Phoenix will develop the BIOS Enumerator, which provides access to system board devices during a configuration process.

DOD official hit with harassment suit

The U.S. Department of Defense asked its inspector general to probe allegations that Gary Denman, head of the Pentagon's Advanced Research Projects Agency, sought sexual favors from IBM representative Veronica Gunther. Gunther filed suit last week against IBM for allegedly forcing her to have sex with Denman in order to win business. Denman denied the allegations but recused himself from dealings with IBM.

SHORT TAKES IBM said its DB2 3.0 database system, which allows for some distribution of data, will be generally available Dec. 17.... Microsoft Corp. has reported some problems in an unspecified number of its recently released Microsoft Office 4.0 suite. Some versions contain the lead name of the Microsoft product tester in the employee name information box in the Microsoft Office Manager shell. The company said the gaffe does not result in any technical problems but will replace any copies upon request.

DOD plots common IS scheme

By Jean S. Bozman

The U.S. Department of Defense's game plan for a standards-based architecture (SBA), released for public review this month, is one of the first fruits of the 4-year-old Corporate Information Management (CIM) initiative.

The SBA guide describes a new world of systems built on common building blocks that are supposed to reduce software development and maintenance costs. Key elements include reusable code, standard platforms and shared data repositories. Software accounts for more than half of the DOD's \$9.5 billion annual information systems budget, excluding classified systems.

The SBA — based on Posix, Government Open Systems Interconnect Profile, TCP/IP and the International Standards Organization 9000, for example — promises a framework for remaking the DOD's IS infrastructure. "If the [SBA] concept is accepted within the [DOD] user community," said Bob Deller, a vice president at Input in Vienna, Va., "then someone will probably come in as a contractor and lay it all out."

The Defense Information Services Agency (DISA), provider of central IS services to DOD agencies and publisher of the SBA guide, is looking for user comment. "We want feedback," said John J. Keane Jr., a senior DISA planner. "Within two years," he said, "instead of seeing hundreds of ways of doing business with DOD, users will see one, and we'll take care of any translation and navigation that needs to be done."

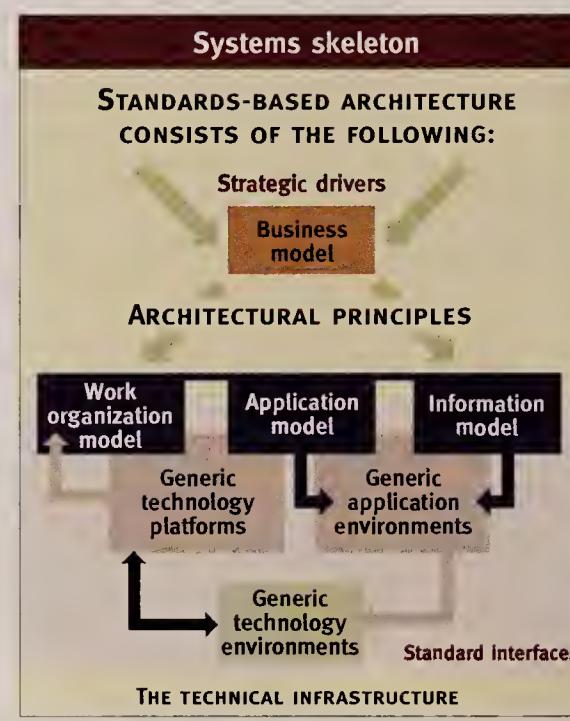
That may be a tall order because the DOD has virtually every major type of computer, from PCs to minicomputers to mainframes. Each military agency will specify its own technology, weeding out redundant systems, consolidating data centers and building a centrally managed network.

The benefits of SBA will come from breaking down

barriers among hundreds of independent systems. "Open means that you are vendor-independent and that the software is portable," said Paul Strassmann, CIM director until January and now a consultant at Ernst & Young. "It doesn't mean Unix or another operating system. It means that the code and the objects that get delivered from application A can be reused in application B."

The SBA's debut has come, however, as CIM's momentum has slowed following the change in administrations and a review of CIM's lack of progress.

However, Strassmann's successor, Ret. Gen. Emmett Paige, agrees with the premise of CIM, which is to consolidate data centers and adopt object-oriented development methods, a DOD spokeswoman noted. "But he wants to see the process move along a little faster than it has."



Source: Defense Information Services Agency

last year], people are recognizing that a significant amount of [the work] can be reused for other organizations." He said he believes other military services could build their own SBA model in six months.

Despite SBA's stated goals, today's Marine Corps has few open systems on-line at its 27 sites in the U.S., Hawaii and Japan, users said. Its LANs connect more than 25,000 PC users to mainframes that are linked via an IBM SNA network.

The Marine Corps uses Unix sparingly, mostly for "tactical" real-time systems deployed in combat, according to Lt. Col. Bob Shearer at Marine Corps headquarters in Arlington, Va. To integrate systems, the Marines may elect to use the X Window System to allow PC users to view mainframe and Unix server data, he said.

Framing re-engineering plans

Architecture is fast becoming a way for large IS organizations to protect valuable re-engineering plans from being ruined by changes in open systems technology.

Declaring a "profile" based on functionality, these users have the flexibility to plug new products into the architectural framework as they go along.

In addition to the Department of Defense, other organizations that have an open systems architecture include Charles Schwab & Co., The Chase Manhattan Bank NA and Sun Microsystems Computer Corp.

Insulation from specific prod-

ucts is key, as is storing business rules in high-level application code, users said.

"Do your homework first, have an architecture, have a standard tool set, have training and have a methodology," advised Gene Friedman, Chase Manhattan's vice president of applied technology.

Shopping limits

The New York bank has many global systems, including Unix servers, IBM mainframes and Novell, Inc. PC LANs. But its shopping list is short. "The issue is interoperability," Friedman said. "There is a limited set of

things you can choose."

DMR Group, Inc., which helped the U.S. Marine Corps design its model architecture, advocates business process re-engineering, followed by technology adoption.

"Once you have an architectural framework, then you can hand off to the technology guys to operate creatively within the structure," said DMR's Boston director Robert Howie.

"Instead of arguing over [IBM] DB2 vs. Oracle [databases], you standardize on SQL," he said. "You can let 1,000 flowers bloom, as long they can connect." — Jean S. Bozman

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Mike Keesee, Vice-President Planning Systems, American Software.

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Outsourcing

British Aerospace enlists CSC

\$1.35B deal calls for outsourcer to buy most of client's IS assets

By Mark Halper

British Aerospace PLC finally chose its outsourcer last week, and in the process, demonstrated that large outsourcing deals are still as much financial arrangements as they are technological ones.

The 10-year, \$1.35 billion deal with Computer Sciences Corp. calls for CSC to purchase most of British Aerospace's computer assets, from mainframes down to PCs, for \$112.5 million.

Both sides expect to complete the transaction by this coming spring, after details and due diligence are worked out.

CSC, which edged out rival Electronic Data Systems Corp. in an evaluation that began a year ago, will save British Aerospace 15% in information technology costs. These costs are currently around \$150 million annually, according to Len Milsom, information technology director at the \$14.8 billion maker of weapons and commercial and military aircraft.

And the company could use the cash. Although its defense

business has been healthy — UK defense cuts have been moderate and business with Saudi Arabia has been brisk — softness in the market for small commercial aircraft led to a loss of \$300 million in the year ended Dec. 31, 1992.

CSC is taking over data center operation and consolidation, net-

technology implementation, Milsom said. For starters, CSC will consolidate eight IBM and Digital Equipment Corp. data centers, which serve 13 factories and the company's Farnborough headquarters, into two facilities, Milsom noted.

"There were inefficiencies in the way we were doing things," acknowledged Milsom, referring to the company's data centers.

The British Aerospace information technology chief maintained that the company entertained an internal proposal up to the end of the evaluation process, but he said CSC and EDS were both better able to generate cost savings and move the company into new technologies while it concentrates on its core businesses.

According to Milsom, the price tag of the CSC offer and the EDS proposal were virtually identical. British Aerospace chose CSC over EDS because it "felt more comfortable, and CSC had more experience in our line of work," he said, noting that CSC has a substantial list of defense contractor jobs, including a \$3 billion outsourcing deal with General Dynamics Corp.

Architectures in flux

The exact shape and technological direction of the deal will be determined as CSC works out computing architectures with each of 13 different British Aerospace production sites, Milsom said. Some of those operations, starting with the smaller ones, will move to client/server architectures.

The Big 3		
Contract	Year	Amount
General Dynamics/CSC	1992	\$3B
McDonnell Douglas/Integrated Systems Solutions Corp.	1992	\$3B
British Aerospace/CSC	1994	\$1.35B

Money talks

The 10-year, \$1.35 billion deal with CSC calls for CSC to purchase most of British Aerospace's computer assets for \$112.5 million. An analyst who asked not to be identified said CSC beat out EDS because it offered more cash upfront.

works, distributed computing and application development. British Aerospace will use its savings to help move into new technology areas, Milsom said.

The firm turned to outsourcing for several reasons, including an old-fashioned one, analysts said. "Cost was the bottom line," said Dean Witter Reynolds analyst Tim McCollum.

CSC will achieve the savings through systems consolidations and new tech-

All clear

Questions regarding national security have surrounded the British Aerospace outsourcing evaluation ever since it began entertaining bids from American firms. British Aerospace said, "National security issues have been fully addressed."

Waiting game

CSC and British Aerospace expect to complete the deal by spring, but outsourcing contracts often take longer to close than anticipated.

About 1,250 of British Aerospace's 1,450 information technology employees will transfer to CSC, and about 900 of those individuals will continue to work on British Aerospace projects, Milsom said. The remaining 200 employees will stay with British Aerospace in managerial positions.

Employee walkout

Employee issues were a sticking point, just as they are in an ongoing outsourcing evaluation at the UK's Inland Revenue Service (see story below). Last August, about 200 information technology workers at British Aerospace's military aerospace site in Warton staged a one-day walkout in opposition to any outsourcing deal.

Milsom said British Aerospace has won assurances from CSC that the outsourcer will not cut workers' pay or benefits.

Labor pains

Employee objections have been a stumbling block in British Aerospace outsourcing negotiations. The labor backdrop for the UK's Inland Revenue Service's megadeal outsourcing evaluation is no less contentious.

Some 50,000 Inland Revenue workers joined a Nov. 5 nationwide strike of civil servants who object to the UK's "market testing" program of seeking private contractors to take over work performed by civil servants.

Inland Revenue information technology workers also walked out for a day last April, specifically protesting against any outsourcing arrangement, according to an Inland Revenue Staff Federation spokesman. And they have refused to work overtime, also in protest of an outsourcing deal, the spokesman said.

Inland Revenue is expected by next month to choose between CSC or EDS or keeping information technology in-house.

—Mark Halper

IBM to unveil first mainframe RAID device

CONTINUED FROM COVER 1

level expected from the IBM unit. For its part, Storage Tek has said it will ship Leeberg in quantity "early next year" [CW, Nov. 1].

An IBM spokeswoman confirmed that the company will announce a high-speed and a RAID device in the first quarter, but she refused to provide any more details.

Both IBM's high-availability and RAID models will include 2G-byte, 3½-in. disk drives. The first device, tentatively named the 9390-HP, was characterized by Gartner Group, Inc. analyst Nick Allen as the "EMC stalker." It is said to feature an integrated controller and as such will not attach to the

3990 controller. It will include more than 2G bytes of cache storage to provide higher performance than today's top-of-the-line 3390 Model 3. List prices are expected to be about \$5 per megabyte.

The RAID unit, called the 9590-HA, will have a maximum capacity of about 100G bytes per subsystem, which will allow for the space needed to store information required for RAID redundancy. It will attach to the 3990 Models 3 and 6, with performance roughly equal to that of the 3390 Model 3. List prices are

expected to be about \$7 per megabyte.

These high-end products are expected to appeal to customers who want some or all of their data in fault-tolerant or extra high-

performance storage media. "We have some prospects" that might require those kinds of environments, said Thomas Woods, vice president at Halliburton Co., an energy concern in Arlington, Texas. "We do some work at the well sites with our customers, and we want to make sure that data is protected."

Other customers were less impressed. "I guess I'm just whelmed," said Doug Underhill, vice president at CSX Transportation, Inc. in Jacksonville, Fla. He said today's most current high-end disk drives, with street prices of about \$6.50 per megabyte, have enough availability and performance for his needs. "If the price got down to about \$1 per megabyte, now that would be really exciting," he said.

Nevertheless, Vellante said, IBM needs the new wares to help stem the storage unit's revenue declines, which have been averaging about 15% to 20% per year.

Corrections

Due to a production error, the second letter in the "Letters to the editor" section in the Nov. 8 issue omitted the name of the writer, Anthony P. Mayo at TeamWorks in Reston, Va.

Due to a reporting error, a story in the Nov. 1 issue incorrectly referred to Microsoft Corp.'s group product manager for Windows NT. His name is Greg Lobdell.

The full name of a Woburn, Mass., manufacturing software vendor mentioned in the Nov. 8 issue is Spectrum Associates, Inc., not Spectrum, Inc.

Enterprise Client/Server: Connectivity

"If interoperability was just about connecting data with applications, implementing enterprise client/server would be easy. It's getting them to work together without losing performance or functionality that keeps you up at night. And to solve it, you have to..."



Mark Page knows the situation well. Vice President of Connectivity Products at Sybase, he's helped a long list of customers develop integrated solutions to one of the most significant problems in client/server computing. He shares that experience in a taped conversation "Making Connections In Client/Server Computing." For your copy, call 1-800-SYBASE-1.

Utility taps Oracle for customer service system

By Kim S. Nash

Loosened utility industry regulations have forced Duke Power Co. to revamp its technology infrastructure, starting with the construction of a customer information system built with the aid of Oracle Corp.

The \$4 billion utility recently signed a \$23 million software development and consulting pact with Oracle and is working with CSC Index, Inc. to re-engineer its customer service and other parts of the company. Duke provides electricity and other power to 1.7 million homes and businesses in a 20,000-square-mile area of the Carolinas.

The pact is part of a plan among utility firms to slim down to fighting form in anticipation of turf battles as power industry laws are increasingly relaxed. Northeast Utilities, for example, is counting on Asynchronous Transfer Mode networking projects to make it more competitive [CW, Nov. 15].

"Utilities are having to get more competitive all around, and technology is one key way to do that," said Joe Hunter, manager of information systems at Baltimore Gas & Electric Co. Hunter meets frequently, though informally, with IS chiefs at utility and manufacturing firms. Duke's planned customer information systems overhaul is not leading-edge, Hunter said, but "service is ever evolv-

ing, so there's no such thing as focusing on it too much."

For starters, Duke plans to toss out a 25-year-old, homegrown IBM mainframe-based customer information system in favor of a Unix version built on a template Oracle created with Pacificorp, a utility in Portland, Ore. The system will be based on Oracle databases and developed with Oracle tools.

Duke is the first user to engage Oracle Industries, a program announced in July to sell consulting services and prefabricated application templates designed for specific vertical industries [CW, July 19].

Customer choice

Like other utilities, Duke will be thrust into an open market next year, when the Energy Policy Act of 1992 kicks in to effectively free home electricity users to choose from several providers rather than be forced to buy from one regional player. Wholesale corporate utility customers have already received that freedom under the act. These free-market moves mean that for the first time, utilities will go up against rivals because consumers will no longer be locked into a single, like-it-or-not provider.

Duke Power Co.
1992 revenue
\$4B
1992 net income
\$508M
IS budget*
1.8%
*as a percentage of revenue

Source: Computerworld Premier 100

Thus, the push to re-engineer came from the business side of Duke, not IS, said Dan DuBose, manager of information technology at Duke's customer group. The utility's goals include the following:

- Shave response time to customer calls by 25% to 50%.
- Reduce Duke's software maintenance drain from 80% of IS staff's time and resources to 40% or less.
- Replace all character-based dumb terminal interfaces with graphical user interfaces.

DuBose said he is concerned about a lack of systems management tools designed specifically for client/server setups. However, he is sanguine.

"We're at the right moment in time" to ditch mainframe computing for client/server, he explained. "We're betting the tools will be there to let us pull this off when we want to deploy."

Oracle's utility template will help jump-start the application development process, saving developers anywhere from 20% to 40% of the time they would normally spend on creating systems in-house from the ground up, said George Wackerhagen, manager of customer

group re-engineering.

Duke's two-year contract with Oracle calls for the customer information system to be delivered in two stages. In the first phase, to be completed by October 1994, Oracle is expected to convert Duke's mainframe data to Unix and create a streamlined billing system for industrial electricity customers. The rest of the system is due a year later and is scheduled to encompass home customers, possibly allowing them to pay electric bills and request information via automated teller machines.

Streamlining essential

Meanwhile, re-engineering work with CSC Index began early this year and is just now yielding blueprints for revamped customer service practices. Plans for streamlining customer inquiries, troubleshooting and power emergencies touch on the power and corporate groups as well as the customer unit, Wackerhagen said.

But because CSC Index continues to study and make recommendations for rethinking Duke's entire business — including customer service — Duke has reserved the right to make changes in the Oracle contract. "If we find, through re-engineering studies, that we don't need something from Oracle that we originally thought we did, we can take that right out of the contract," DuBose said.

Workin' on the railroad

CONTINUED FROM COVER 1

liveries arrive on time, compared with 90% for trucks. Although railroads have been making a comeback in recent years, truckers have trounced them with this competitive advantage in the last decade (see chart).

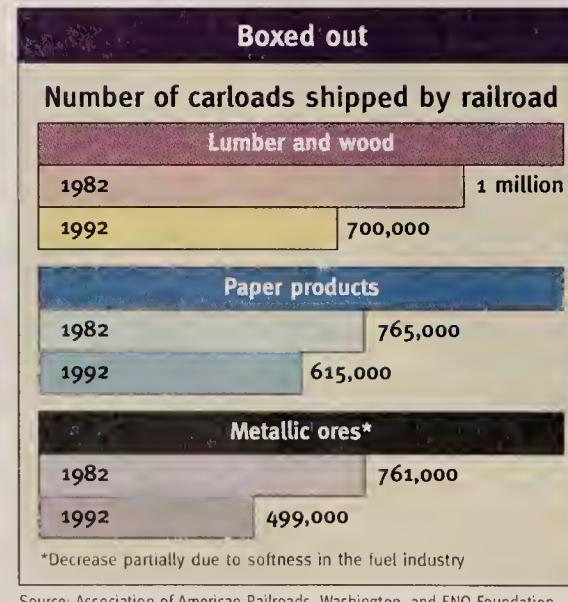
"We have to do a lot more to make our railroads look like one and the same to the customer, to get more seamless and make us more truck-competitive," said Chuck Schultz, vice president of management services for the Atchison, Topeka and Santa Fe Railway in Schaumburg, Ill.

General consensus

There was a chorus of agreement throughout the industry.

"Railroads have cooperated since the appearance of computers, but we recognize we have to cooperate more so that there will be much less differentiation between the two modes of transportation," agreed George Sekely, senior vice president at CSX Transportation, Inc. in Jacksonville, Fla.

Scott Flower, a railroad industry analyst at Kidder Peabody & Co., noted that the technological cooperation is part of a trend among railroads to work together to offset trucking pressures.



Source: Association of American Railroads, Washington, and ENR Foundation

to cooperate," Flower said.

The first of at least two RFPs for the AAR's interline service management project seeks a provider for a central switch in an EDI scheme. The EDI network, which will conform to ANSI X.12 standards, will permit railroads to alert one another about schedules, schedule

changes and cargo of individual cars and for entire trains. It will also allow them to swap rate information.

The manual process that railroads currently use to run those operations results in service delays to customers, said Charles Dettman, vice president of operations and maintenance for the AAR.

Dettman said the AAR is issuing RFPs to outsourcers such as Electronic Data Systems Corp. and Perot Systems Corp., as well as to the AAR's technology subsidiary, RailInc.

The AAR's plan is to have the first phase in place by January 1995. "It has to be because we are implying to our customers it will be there by then," said Ralph von dem Hagen, vice president of customer service at Consolidated Rail Corp. in Philadelphia.

Central database

The second RFP will seek construction of a central database repository that railroads would use to exchange bills for one another's hauling services and possibly for repairs. Under the AAR's plan, all railroads would use standard customer file formats.

Other projects down the road would include EDI support of interline repair billing and computerized radio track-occupancy systems to replace antiquated

Half of all rail cargo changes lines at least once, resulting in on-time deliveries only 70% of the time, compared with 90% for trucking. Railroads will use technology to try to even the score.

ed technology such as colored lights.

The industrywide initiative must cope with the tension inherent when rivals try to cooperate on a project. As the industry fuses efforts, for instance, Union Pacific Railroad in Omaha and the Santa Fe line are marketing their own scheduling software packages to other railroads for internal use.

Individual initiatives

And individual railroads are undertaking their own internal information systems overhauls, such as Southern Pacific

Line's recent outsourcing deal with IBM's Integrated Systems Solutions Corp. subsidiary, to try to get a leg up on the competition [CW, Nov. 15].

But the goal of the interline service management project, von dem Hagen noted, is to provide technology that would link the railroads, regardless of their internal systems.

Don Gagen, assistant vice president of customer service and systems at CN North America/Grand Trunk Western, Inc., the Detroit-based U.S. subsidiary of Canadian National Railways, agreed. "If you look at market share between the truck and rail industry these days, I think everyone will understand the rail industry better do something quickly," Gagen said.

PC surge at Texas utility goes to ISSC

By Mark Halper

A deluge of requests for PCs that raged out of control after Texas Utilities Co. lifted a purchasing freeze has led the \$4.9 billion electric firm to outsource network PC services to IBM's Integrated Systems Solutions Corp. subsidiary.

"We had a two-year freeze on buying systems, and when we lifted it, the floodgates opened," said H. B. Keating, vice president of information technology at Texas Utilities.

The company's ability to handle PC operations and the rush of orders was also hindered by a hiring freeze and by head count reductions that had depleted the number of people available for staffing PC management, he added. The utility, which now has 10,600 employees, eliminated about a third of its work force between July and December 1992 through early retirement and voluntary departures, a spokesman said.

It also began a concentrated effort early this year to outsource other operations as it vies for business in an industry only recently opened to competition by the Clinton administration and the Energy Policy Act of 1992, which permits utili-

Court upholds RBOC rights

The Supreme Court last week laid to rest lingering controversy over whether the nation's regulated local telephone companies should be allowed to provide information services.

In a no-fanfare decision, the court gave AT&T's former Baby Bells the nod to continue providing information services, a right they have had since 1991 when U.S. District Judge Harold Greene lifted the ban on such services within the AT&T divestiture Consent Decree.

Last week's decision represented another regulatory deshackling aimed at allowing the invisible hand of competition to drive innovation and price competition in the local arena akin to what users have enjoyed in the long-distance market since 1984. Video programming is likely to be the RBOCs' next frontier.

"Regulators recognize that putting up artificial channels to keep [the telecommunications and computer industry] separate is not going to work," said Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J. "It's clear they believe a free market is in the interest of the public good."

The ruling rejected arguments by would-be competitors that the regional telephone companies would have an unfair monopoly in information and other enhanced service markets because of its ownership of most of today's local telephone lines.

—Joanie M. Wexler

OUT Sourcing

ties to sell power in other utilities' traditional geographic areas [CW, Nov. 15].

"The whole industry is restructuring, and companies are doing some innovative-type things as competition comes in with passage of the Energy Act," noted Daria Roulett, an utilities analyst at Lehman Brothers, Inc. in New York.

ISSC bested offers from Dallas-based

Electronic Data Systems Corp. and Chrysler Systems, Inc. in Oak Brook, Ill., to manage some 4,200 PCs linked via IBM LAN Manager and Novell, Inc. NetWare LANs for five years [CW, Nov. 15].

ISSC was chosen over EDS, Keating said, because the IBM subsidiary was thought to be more adept at handling the IBM OS/2 operating system that is widely

installed at Texas Utilities.

The IBM unit will take over "the entire aspect" of PC and LAN services, including defining needs and specifications, purchasing, training, client/server installations and help desk operations, Keating said.

Keating said Texas Utilities will offer jobs to the 14 staffers and 10 contractors impacted by the contract. Those workers will also have a chance to interview with ISSC, he said.

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SPF/PC ANALYZE: C:\TEST\IMS.CBL
File Edit Navigate Search Views
000125 000 MAIN.
000126* THIS IS THE MAIN PARAGRAPH. HERE WE INITIALIZE STORAGE
000127* AND GET THE FIRST INPUT STRING. WE ALSO PERFORM FIRST
000128* PASS PROCESSING HERE AND PROCESS MENUS A, B, AND
000129    PERFORM A100 INITIALIZE-WORKNG-STORAGE
000130    PERFORM A110-GET-INPUT-STRING
000131    IF FIRST-PASS HAS OCCURRED
000132        CONTINUE
000133    ELSE
000134        PERFORM A120-1ST-PASS THRU CONVERSATN
000135    END IF
000136    EVALUATE SPA-CURRENT-SCREEN-TYPE
000137    WHEN 'MENU-A'
000138        PERFORM A200-PROCESS-MENU-A
000139    WHEN 'MENU-B'
000140        PERFORM A300-PROCESS-MENU-B
000141    WHEN 'SCRN-C'
000142        PERFORM A400-PROCESS-SCRN-C
000143    END EVALUATE
000144    PERFORM A900-SEND-SCREEN
000145    CALL 'SAVE'
000146    GOBACK.

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IBM revamp

OS/2, AIX, PowerPC critical

By Ed Scannell
LAS VEGAS

Acknowledging that IBM has been complacent and sometimes out of touch with user needs, James Cannavino, senior vice president of strategy and development, promised to make the company's most aggressive push to date to build open systems that will empower users to better define their computing fates.

Speaking publicly for the first time as IBM's chief technical strategist at Comdex/Fall '93 last week, Cannavino said the troika of OS/2, AIX and the PowerPC chip will largely power IBM's client/server strategies for the rest of the decade.

Giving this message added weight was the solid backing Cannavino received from his boss, IBM Chairman Louis V. Gerstner. In a taped speech at the show, Gerstner said, "There is nothing more critical to us" than OS/2 and AIX, which he described as the twin pillars supporting IBM's future open platforms.

Eliminating any doubt that IBM is fully committed to the long-beleaguered OS/2, Gerstner noted the company is making major investments in OS/2-compatible relational databases, communications products and tools, as well as a budding consulting business.

Taligent support

Moreover, both Gerstner and Cannavino also made it clear that they are firmly committed to the object-oriented operating system under development by Taligent, Inc. IBM will eventually make available



James Cannavino

Big deal
Cannavino claimed IBM is negotiating with 50 OEMs to sign a deal for its PowerPC chip. He declined to name the companies or speculate on the prospects for closing some of those deals.



Louis V. Gerstner

able runtime versions of the Taligent operating system across most of its major host-based platforms, according to Cannavino.

"Any investment made by customers in OS/2 or AIX will only be reinforced in Taligent," Gerstner said.

Being open means supporting Microsoft Corp.'s Windows NT at some level, however, and Cannavino suggested that "if Microsoft ever sells enough of it," IBM might consider adding a Windows NT look and feel on top of WorkPlace OS.

The right course

Most observers say they largely agree that IBM is now pursuing the right course in giving its customers the freedom they need to make the proper strategic decisions.

But with Microsoft hard-charging in corporate accounts with Windows NT and Advanced Server, some wonder if the company's decision to do so is too late.

"IBM is right in putting so much emphasis [on OS/2 and AIX] because clearly the growth area is software. But while IBM is holding on to its top 1,000 customers or so, Microsoft is eating everything else around it," said Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

Finkelstein and others agree that OS/2 has made a resurgence over the past three or months based on the stability of Version 2.1 and the validity of its long-term vision. But some say IBM still has a lot to learn about marketing outside its loyal corporate customer base.

32-bit theatrics

CONTINUED FROM COVER 1

platforms," said John Chapman, senior technology consultant at Amoco, Inc.'s technology introduction group.

While Chapman and several other managers said users stand to benefit from the operating system's multitasking, memory management and Object Linking and Embedding 2.0 support, none expect Microsoft to deliver a product that comfortably does all that on just 4M bytes of memory.

"[That] would be silly for anyone to expect. We can't run Windows [3.1] in much less than 8 [megabytes]," said one corporate manager at a major truck rental company. "If Microsoft says it runs in 4, I'll tell my people to go to 8 and hope we can run it acceptably."

Microsoft was unable to show the finished user interface for Windows 4.0, which is still in the early design stage. While Chicago's user interface is intended to make the operating system easier to use and

reduce training costs, some corporate managers remain skeptical. They noted that even technical advances in user friendliness can at first intimidate users.

"With its installed base getting so huge, Microsoft has become like IBM, who was always forced to make small, incremental changes," said one corporate beta tester. "They should think about how different they make the interface. If it is radically different, [the] user's first inclination will be to set it aside for a while."

Microsoft officials said they intend to evolve the Windows interface to a more document-centric look and feel.

But what was shown of the interface at Comdex partly resembled the object-oriented look of IBM's WorkPlace Shell. By combining Windows' Program and File Managers, Chicago appeared to have a cleaner look.

In showcasing Chicago's Plug-and-Play features, Gates and Silverberg demonstrated how much simpler it is to integrate sound boards and add-ins such as CD-ROM drives on the fly to an existing

system under DOS and Windows.

The Chicago demonstration was done on a 486-based portable from NEC Corp. that contained a Phoenix Technologies Ltd. BIOS, which Microsoft announced last week it is licensing. Both products, along with Chicago, support the Plug-and-Play initiative.

IS managers wondered how easy this would be on systems not ascribing to Plug-and-Play.

"It's a nice idea on cold turkey platforms, but what about on real machines where you are installing over the top of something without disturbing someone's apps? That is where this stuff falls down," Chapman said.

Microsoft is scheduled to release the first 3,000 software developer's kits at a developer's conference Dec. 13 in Anaheim, Calif.

Gates said Chicago is on track for a second-half 1994 release.

"Maybe at this show next year we'll see lots of companies in their booths here running their products on Chicago," Gates said.

He also demonstrated the product's ability to drag and drop objects from folders to the desktop.

Backlog backlash

An IBM PC Co. executive recently sent a letter to customers and dealers apologizing for delivery problems and pledging to be more open about shipment schedules in the future.

The letter, obtained by *Computerworld*, is from Bruce Claflin, president of PC Co. Americas. In it, he said that while "the IBM PC Co... expects to ship 20% more in this quarter than last... we are not out of the woods yet. Both the PS/2 and ThinkPad lines are still in tight supply." The letter said the PC Co. does not expect to fill all its orders for these two lines this year.

Claflin's letter explicitly said the PC Co. has stopped trumpeting backlogs as a good problem, its former stance. He promised that "when products are significantly back-ordered, we intend to give straight answers on why... We owe you straight answers so you can make an informed buying decision."

Alan Hald, vice chairman of MicroAge, Inc., a Phoenix reseller, applauded the PC Co.'s move toward openness. "That's what our clients want—a commitment from IBM on when they can ship products."

Claflin also wrote that the PC Co. will shift component demand to alternate suppliers when component shortages cause product delays, as is the case with PS/2 and ThinkPad products.

Delays in the ThinkPad line, hard hit by the worldwide shortage of thin-film transistor, active-matrix screens, may ease. The PC Co. last week began shipping the 750CS, which offers a dual-scan, passive-matrix color screen. The PC Co. has touted this product as one that will ease demand for its high-end ThinkPad 750C.

But Michael Winkler, Toshiba America Information Systems, Inc.'s vice president and general manager, said Toshiba has found that most of its corporate customers prefer to wait for the active-matrix color, which suggests that long-suffering PC Co. customers will continue to endure pain.

—Michael Fitzgerald

Lotus eyes low-end groupware

Michael Vizard and Lynda Radosevich

LAS VEGAS

Lotus Development Corp. is putting together a three-tiered workgroup computing strategy to counter Microsoft Corp.'s forthcoming workgroup plans. The strategy calls for positioning its nascent Notes-based Lotus Communications Server (LCS) against Microsoft's also unshipped Enterprise Messaging Server (EMS) for Windows NT.

While Notes will become Lotus' high-end client/server platform, the midrange of Lotus' strategy will be a CC:Mail-based offering that will be enhanced with a number of client/server workgroup-oriented features, according to Eileen Rudden, Lotus' vice president of product marketing.

On the low end, Lotus will continue to support a file-sharing version of CC:Mail.

Lotus is racing to put its high- and low-end workgroup strategies in place before Microsoft can get EMS out the door next spring. Microsoft is expected to try to undercut Lotus by selling EMS on an NT server and giving away client software with Windows 4.0, also called Chicago.

Lotus appears to be countering with a low-price workgroup model built around CC:Mail. But Notes resellers said the strategy may play into Microsoft's hands.

"I would rather see them come up with a Notes 'lite' or a Notes mail-only in order to keep the focus on Notes. Microsoft doesn't have anything right now, so Lotus should make Microsoft come to them," said Norman Weizer, president of Weizer Associates, Inc. in Lexington, Mass.



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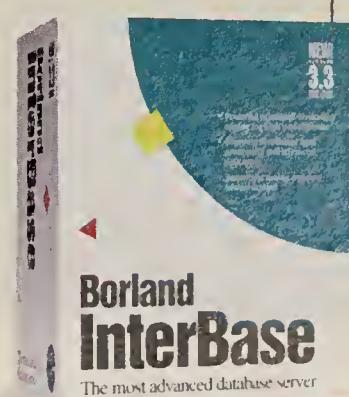
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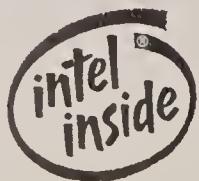
processor doesn't make much difference.

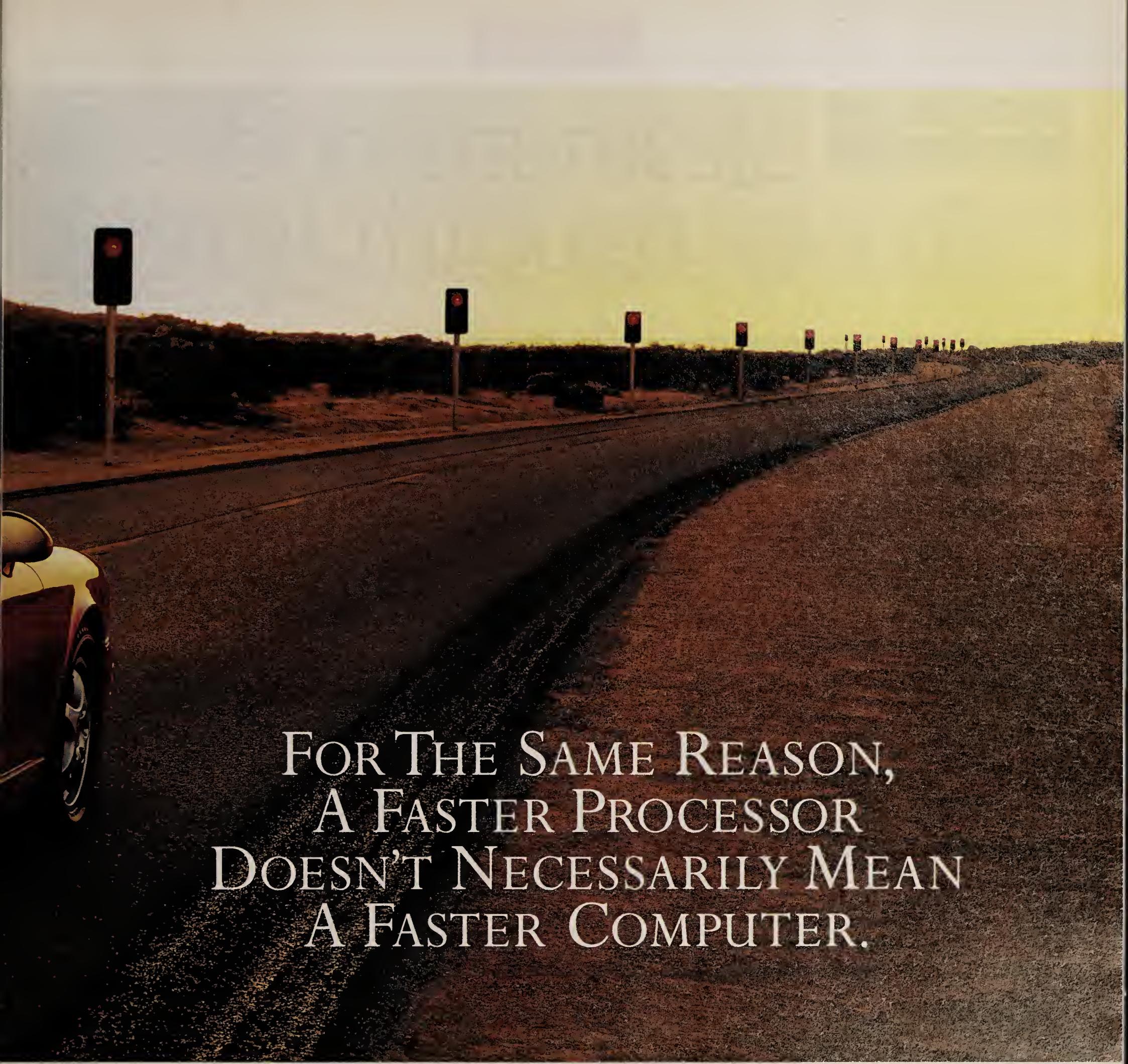
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**Reporter's
Notebook**

► Perhaps trying to be overly humble, Microsoft Chairman Bill Gates noted in his Comdex keynote speech that his company ranked "only" 20th in worldwide revenue. Gates said little old Microsoft chooses to specialize in just one area,

while the companies ahead of it on the revenue list make money in several market segments. He was quick to note, however, that Microsoft has business relationships with 18 of 19 firms ahead of it; Sun Microsystems is the exception.

► The omnipotent Microsoft was everywhere at Comdex, demonstrating Chicago for the first time (see story page 16), showcasing hundreds of OLE-compliant applications (see photo page 28) and

even showing up in the humor column. During a session on network operating system standards, panelist Stan Schatt, director of LAN service at Computer Intelligence/InfoCorp, cracked the following joke: "How many Microsoft people does it take to screw in a lightbulb? None. They simply declare darkness a standard."

► If technology doesn't grab attendees, vendors reason that celebrities will.

Stars abounded at various booths: IBM PC Co. had the comedian Gallagher and Mannesman Tally had ex-football star Gale Sayers, but Motorola had Brent Spiner, Lt. Data in *Star Trek: The Next Generation*.

► Of course, if all else fails, there's always flesh. A chunk of the show's multimedia contingent used cheesecake and pornographic clips in their technology demonstrations. Among the sexist offerings was a CD-ROM program used to "undress" *Penthouse* models.

► Apple's Newton may be dumb, but it can provide a new way to get you out of meetings. At least that's what it did for Apple CEO Michael Spindler when he demonstrated Newton during his Comdex keynote (see story page 29). He scheduled a meeting on his electronic schedule for a Wednesday lunch. The Newton misspelled Wednesday, then booked the meeting for a Monday. Spindler appeared not to notice and finished the demo by saying, "Newton will change the way you run a schedule."

► On the comeback trail is Northgate Computer Systems. The company says that not only is it back from the brink of financial death, but it is looking to be the first to market with a Pentium notebook. Though even Intel officials say informally that they do not expect to see Pentium notebooks shipping in volume until first-quarter 1995, Northgate officials said they thought they would offer a Pentium-based notebook as early as April 1994. The design will feature a fan built into the notebook casing and will weigh 6 pounds.

► PC-to-PC videophone systems from Twincom in Wilmington, Conn., drew oohs and ahs from onlookers. The PC video images and sound were smooth and synchronized, but the systems run only on a LAN, not across phone wires, a fact that bothered some potential users at the booth. The systems, to be available this spring, include a camera with speakers that sit on top of the PC, an adapter card and software for \$1,995.

► Talk about negative reinforcement: Interface Group officials twice ordered Micrografx to shut down its booth show because its stunts were drawing too big a crowd. The company showed its graphics software being used to design in-line skates, capping the presentation with an eye-popping Rollerblading demonstration. Vendors in neighboring booths complained that the crowd was infringing on their space—and their business. By the way, Micrografx's chili cookoff raised an estimated \$300,000 for the National Center for Missing and Exploited Children.

► Among the most sought after "gimmicks" at Comdex was a CD called "Gates Unplugged." Featuring a picture of Gates with a laptop, the CD was a take-off on the recent spate of "unplugged" CDs that have appeared in the music industry. With the CD, users and developers can view state-of-the-art 32-bit Windows and OLE 2.0 applications.

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Cellular data services crystallize

By Lynda Radosevich
LAS VEGAS

Spurred largely by a massive rollout of new wireless data products and services, users at Comdex/Fall '93 said mission-critical wireless applications are less than a year away, and several said they will begin pilot projects by year's end.

Their plans indicate that wireless data applications, once relegated to pioneers such as United Parcel Service, Inc. and Federal Express Corp., are reaching wider acceptance.

"Wireless is in its teen years, not its infancy. We're starting to depend on it," said Eugene Hengel, director of strategic technologies at Insurance Value Added Network Services (Ivans), a membership-owned network services supplier to the insurance industry.

CDPD standard

Most of the wireless announcements here centered around the Cellular Digital Packet Data (CDPD) standard supported by IBM, McCaw Cellular Communications, Inc., the seven regional Bell operating companies and others for sending packet-switched data over existing cellular voice channels.

Dozens of vendors here, including McCaw, AT&T and GTE Corp., demonstrated CDPD networks and devices that are available now or are expected by the second quarter of 1994 (see story below). McCaw also disclosed an alliance with Lotus Development Corp. to CDPD-enable Lotus' workgroup products [CW, Nov. 15].

Users said they are attracted by

CDPD's potential for broad coverage, security-enhancing encryption capabilities and network management capabilities using Simple Network Management Protocol and Common Management Information Protocol. Also, they said they like CDPD's ability to circumvent the high circuit-switched cellular connection charges incurred when sending data over analog cellular channels today.

McCaw and GTE were not ready to provide pricing specifics. However, a wireless applications developer close to the companies said he expected the average monthly bill to be \$35 to \$50 for a user

ers use circuit-switched cellular and CDPD networks to receive claims information and send completed claims to home offices.

"We've been thinking about this for a year, but now the technology is falling into place," Hengel said. Although wireless data services have been available from RAM Mobile Data and Ardis for roughly a year, CDPD is more attractive because of the sheer size of the cellular networks, he said.

Technology of choice

Travelers indicated that CDPD would be its wireless technology of choice in that "it will probably give better throughput" than other wireless technologies "because there is less overhead in the protocol itself," said Gus Bender, second vice president of telecommunications.

Bender said one of his hopes is that Lotus' relationship with McCaw will quickly result in Lotus' Notes groupware application running across CDPD to accommodate traveling executives needing wireless connections to Notes servers. To date, bandwidth limitations of existing networks have precluded Notes from running wirelessly.

Another major user, American Airlines, will begin piloting by the end of November wireless Sabre reservation terminals connected over CDPD links. American Airlines demonstrated a wireless Sabre terminal at McCaw's booth at Comdex. Officials at American Airlines, however, did not return calls for more details by press time.

Although they are counting on CDPD's benefits, users said some issues remain. For instance, because carriers are rolling out their CDPD services incrementally, nationwide service is not likely to be available before the end of 1994.

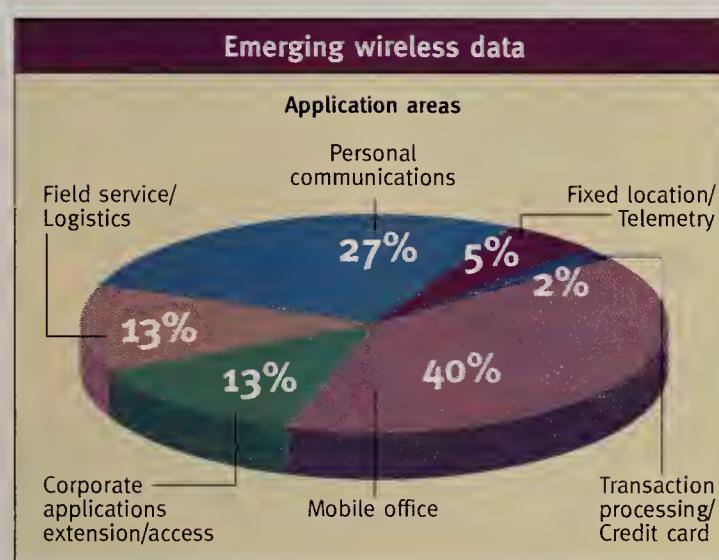
Until then, users can gain broad coverage by combining CDPD, circuit-switched cellular and packet radio services. To meet that need, Sierra Wireless, Inc. in Burnaby, British Columbia, showed a prototype modem that combines wire-line, CDPD and circuit-switched cellular options. The modem will be available in June 1994 for a price targeted below \$800, according to a company spokesman.

Standard interfaces

Other efforts in this area include "standard" interfaces emerging from Motorola, Inc., RadioMail Corp. and the Asynchronous Protocol Standards alliance that link applications to wired and wireless networks [CW, Nov. 8].

Concerns over the regional providers' CDPD services not working together should be alleviated when the providers, including McCaw and GTE, begin interoperability testing by the end of 1993, said Charles Napier, a wireless data marketing director at GTE Telecommunications Products and Services in Atlanta.

Senior editor Joanie M. Wester contributed to this report.



Source: Booz Allen & Hamilton, Inc.

CW Chart: Dave Marshall

who sends an average of two 1K-byte messages per hour. In comparison, the same use over switched cellular technology costs roughly twice as much. New pricing released last week from RAM Mobile Data gives users unlimited use on RAM Mobile Data's two-way wireless network for \$135 per month.

Ivans, based in Tampa, Fla., typifies companies that are planning company-and industry-specific vertical applications. Ivans will begin piloting within 60 days for its members, including Metropolitan Life Insurance Co., The Travelers Corp. and Prudential Insurance Co., a wireless network that lets claims adjust-

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Data... phone home!

Wireless services are reaching a critical mass. Some examples discussed at Comdex include the following:

- McCaw announced commercial rollout of its CDPD network. McCaw said it will add New York, Dallas, Miami, Seattle and San Francisco by January and expects to complete its rollout in 105 markets by mid-1994.
- GTE said it will offer CDPD services in San Francisco and Houston in the third quarter of 1994 and will have service in 61 markets by the end of 1994.
- IBM demonstrated a CDPD module and cellular phone for its ThinkPad notebook computer running Lotus' Notes. The CDPD setup, including the

phone (but not the ThinkPad or Notes), will be available in the first quarter of 1994 for \$1,900, according to IBM officials.

- Several of the Comdex demonstrations used a CDPD modem from Cincinnati Microwave, Inc., which will be commercially available in the first quarter of 1994 for \$495.
- AT&T and Advantis showed the Advantis Passport terminal emulation package running on the ThinkPad. Using AT&T CDPD system, the combination is meant to give users the ability to connect with host applications using a wireless network.

—Lynda Radosevich

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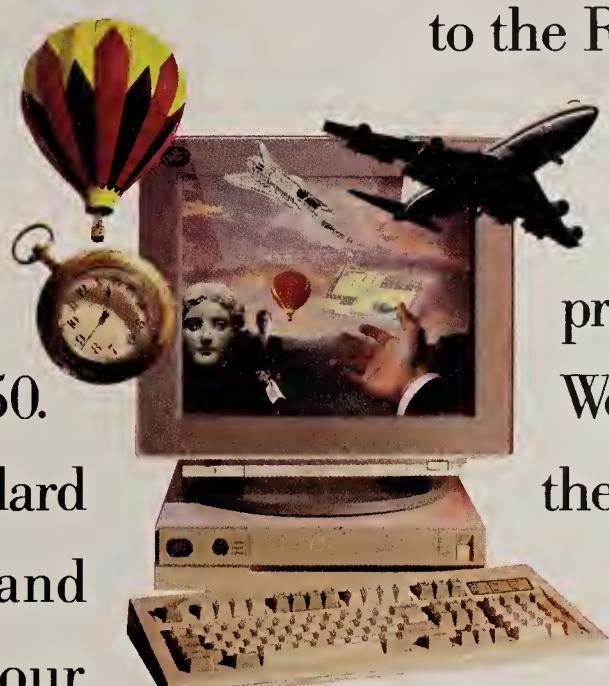
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IBM 990	\$147,800	126.0	\$1,173
HP 160	\$136,530	82.0	\$1,665
DEC 4000/610	\$131,728	94.6	\$1,392



Patent pyrotechnics

CD-ROM publisher claims rights to advanced multimedia retrieval technology

By James Daly

Software publisher Compton's NewMedia set off an uproar in the multimedia world last week when it announced it had patented a core technology used in thousands of competing multimedia applications.

The patent covers the retrieval of text, photo, audio, animation and video information from multimedia databases. The Carlsbad, Calif., firm rocked a Comdex/Fall '93 breakfast when it announced plans to seek royalties on the sales of competing CD-ROM applications, as well as similar search-and-storage techniques used with interactive television.

It will take industry attorneys and engineers months to decide if Compton's has a lock on the retrieval technology. An early examination by some legal experts revealed that Compton's claims may not be as broad as it thinks. "The patent acknowledges a lot of existing systems, so I'm not sure if they'll be able to lay claim to every search technique on the market," said Robert Barr, a patent attorney at the law firm Brobeck, Phleger and Harrison in Palo Alto, Calif.

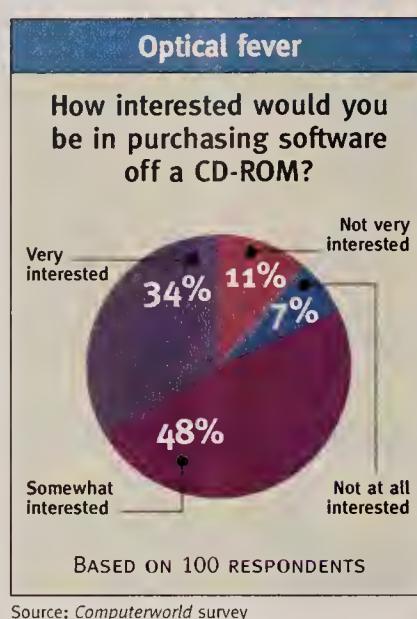
Compton's President Stanley Frank said his company secured the patent in August but does not intend to use it to dominate the industry. He noted, however, that Compton's should "be compensated for the investments we have made."

"Nonsense," said Nick Arnett, president of Multimedia Computing Corp. in Campbell, Calif. "They're acting like they invented the multimedia industry, which is ludicrous."

Unique abilities?

Compton's developed its Smartrieve data retrieval technology in the 1980s to create its Multimedia Encyclopedia; it applied for a patent in October 1989. Compton's officials said their data retrieval methodology is unique because of its ability to explore databases of text or graphics that can be interrelated and yet searched independently of one another.

Patent opponents who fear the document could have a chilling effect on the budding multimedia industry said they plan to challenge the patent in court. Insiders said the Interactive Multimedia Association is mapping out its legal



opposition and that other multimedia industry groups are considering similar moves.

Frank said Compton's will widely license its invention provided developers meet one of several conditions: They must use Compton's software development tools; jointly develop software with Compton's or give it the right to distribute their product; or pay an undisclosed royalty based on product sales.

That is blackmail, Arnett said. "They're trying to intimidate people into signing distribution agreements so they can control the industry," he said. "It's not at all ethical."

The effect of the patent could be far-reaching. InfoTech, a market research firm in Woodstock, Vt., estimated that more than 7,000 CD-ROM titles will be available by year's end, many of them using graphical storage techniques simi-

Borland Office gains ammunition

By Michael Vizard

LAS VEGAS

Echoing strategies already deployed by Microsoft Corp. and Lotus Development Corp., Borland International, Inc. last week outlined a 1994 suite strategy that calls for building visual scripting tools into Borland Office.

The tools will be layered on top of Borland Office 2.0, an upgrade to the Borland suite featuring tighter integration between Borland applications and WordPerfect Corp.'s namesake word processing software under an effort called Perfect Fit. The \$595 Borland Office, which includes the Quattro Pro spreadsheet and Paradox database along with WordPerfect, is scheduled to ship next month.

Perfect Fit includes a customizable icon tool bar called the desktop application directory, a desktop finder that uses the same file manager across the suite, and the ability to use either Borland or WordPerfect icons on all the applications in the suite. Long-term plans include more use of intelligent agents, increased use of common graphical elements across applications and support for the Object Linking and Embedding (OLE) 2.0 and OpenDoc interfaces.

Once OLE 2.0 and OpenDoc are in place in 1994, it will be easier to use suites as components in custom applications.

Borland's strategy parallels Microsoft's recent move to include Visual Basic in its suite. With Visual Basic, users will be able to create applications on top of the Microsoft Office 4.0 suite, which will ship with all its components by year's end.

Meanwhile, Lotus has announced that it will include LotusScript, a graphical derivative of Basic, in SmartSuite in 1994.

But while these tools from Microsoft, Lotus and Borland promise to make application development somewhat easier for information systems shops, they also represent a double-edged sword. Maintaining quality control over applications that end users develop using the tools in the suite will be difficult.

Don Baarns, president of Baarns Consulting in Sylmar, Calif., cautions that IS managers who pursue end-user-driven application strategies will run afoul of exceptions that have to be planned for when creating applications that many people will access.

► Microsoft last week showcased over 30 third-party applications that are in the process of adding support for OLE 2.0.



lar to Compton's. Attorneys estimated the fee Compton's claims a right to will be about 1% of sales.

"And that cost will come right out of the pockets of the consumers," Barr said.

Compton's is one of the leading multimedia application producers, its most notable product being its Multimedia Encyclopedia. The company has 40 CD-ROM titles of its own and distributes 120 other programs from 22 software publishers. Last year, Compton's sales totaled about \$30 million.

The patent also acknowledges that "this invention can be used with any information that can be stored in a database." Analysts said the patent could cover all new platforms that search multiple databases and are interactive, including interactive television and interactive digital entertainment.

Apple declares micro war

By James Daly
LAS VEGAS

Like the skinny guy who loses his girlfriend after getting sand kicked in his face by the beach bully, a newly muscle-bound Apple Computer, Inc. is ready to return with powerful new machines and take on all comers.

In last week's Comdex/Fall '93 keynote speech, Chief Executive Officer Michael Spindler said he intends to do microprocessor battle with market leader Intel Corp.

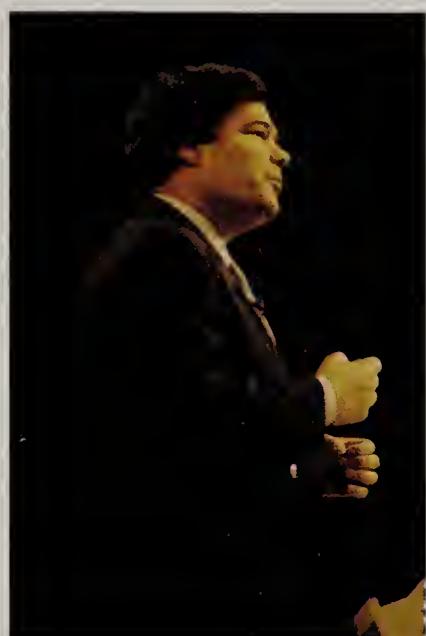
Spindler said his choice of weapon is the powerful RISC-based PowerPC, which is just one part of his multipart comeback strategy for Apple. His plan is to make RISC mainstream on desktops, making RISC boxes Apple's volume mainstay by the end of next year.

Apple's executive vice president, Ian Diery, forecasted that in the next 12 months, 25% to 35% of Apple's volume will be from PowerPC.

Other pieces of the strategy pie include the following:

- Putting multimedia everywhere.
- Offering superior price and performance. [Our PCs] "do more, cost less, fit in and stand out. It's just that simple," Spindler said.
- Applying technology leadership across the industry.

How are Apple's chances? Pretty good in the long run, say analysts who give high marks to the



Apple's Michael Spindler promises PCs that will 'do more, cost less, fit in and stand out'

PowerPC and Apple's intent to support multiple operating systems. Apple will be the only PC company with a machine that can run DOS, OS/2, Windows, Windows NT, Unix and Macintosh software.

Apple's chief drawing card may be that it is the only PC company that has committed to an all-RISC platform at extremely aggressive pricing. "Never again will we use technology to price products higher, but we'll use technology

to drive volume leadership," Spindler said. "Prices on Macintosh will be more aggressive than ever."

The initial PowerPC, the 601, sells for about the same price as an

With the Quadras, users get a desktop with an 80M-byte hard drive and built-in sound for \$970 or less.

Intel i486DX and delivers substantially better performance than the Pentium, especially on floating-point applications, according to Michael Slater, publisher of the "Microprocessor Report" in Sebastopol, Calif.

"Apple is at an incredibly delicate point in its evolution. If they bungle this transition, people are going to switch to Windows en masse. It could be catastrophic if they don't make that a smooth transition," Slater added.

Apple's recent introduction of inexpensive PCs, many of which can be upgraded to the PowerPC next year, also target Intel. With the new Quadras, for instance, users can get a desktop with an 80M-byte hard drive and built-in sound and networking for \$970 or less. That's no more than an ordinary i486-based machine.

Apple users said they were skeptical, however, about the new Quadra 610 that can run both DOS and Macintosh applications. It could appeal to Macintosh fanciers who need to use the occasional Windows application. But reservations remain about whether such a half-breed system will present operational difficulties. "Part of the magic of the Mac is that you have the hardware and software tightly linked," said Dave Lustig, manager of technical services at Bose Corp. in Framingham, Mass.

"You buy a Mac because it has the best operating system out there," said Bob Anderson, a senior analyst at A.O. Smith Automotive Products Co. in Milwaukee. "If I wanted a Windows machine, I'd

desktop OS/2 efforts on its current 16-bit Windows port for OS/2 and future 16-bit and 32-bit versions of Windows that will be compatible with Ferengi, a company spokesman said.

However, the company will support a native 32-bit implementation for OS/2 with WordPerfect Office, its electronic-mail server.

"We see native OS/2 as more of a server environment," said a WordPerfect spokesman. WordPerfect views the IBM deal with Lotus as being driven by the fact that Lotus is the only company that already has a suite available for OS/2, he added.

For its part, Lotus executives said the deal with IBM gives IBM more account control over OS/2 customers and allows Lotus to focus its sales staff on other

PowerPC debut delayed; Apple seeks more support

Apple insiders say the company has backed off its original plan to unveil a PowerPC-based Macintosh in January.

Users should now look for a late February/early March introduction date, with shipments to begin the day of the rollout.

Apple had originally planned a January introduction to coincide with the 10th anniversary of the original Macintosh, with shipments of the PowerPC machines to begin in March, sources said. No longer.

Why the delay? Apple simply wants to build up a bigger head of steam in terms of native third-party application support. A few more names were added last week to the ranks of developers who have pledged native PowerPC applications at ship date, but the total number of those committed is only around two dozen.

Apple officials also announced that System 7 for PowerPC has gone into beta testing.

—James Daly

buy a Windows machine." His company is an all-Macintosh shop, with about 400 machines in the main office and 200 to 250 spread throughout the rest of the country.

Others wondered about compatibility problems. "A good part of the charm of the Mac is that the [operating system], the hardware and the applications are so tightly coupled," said Tim Yancy, a unit manager at Southern California Edison Co. in Rosemead, Calif. Yancy, who works with more than 2,500 Macintoshes, added, "Look at the compatibility problems when you run some software on different DOS machines."

Michael Fitzgerald contributed to this report.

Application trends

Lotus cuts OS/2 pact; WordPerfect draws back

By Michael Vizard
LAS VEGAS

■ It looks like the major PC software vendors are ceding much of the OS/2 market to Lotus Development Corp.

Last week, Lotus extended its joint marketing and OS/2 development pact with IBM by allowing IBM salespeople to sell Lotus SmartSuite software directly.

At the same time, WordPerfect Corp., in a joint letter signed by IBM, announced it has canceled its plans to develop a 32-bit native implementation of its word processor for OS/2, a product that was once relegated to the back burner.

According to WordPerfect officials, the company intends to serve the OS/2 market through IBM's recently improved

ability to run Windows applications on OS/2 desktop systems using its Ferengi technology.

"Those applications now run at very close to native speed," a spokesman said.

In fact, the only OS/2 sites that will require a native implementation of word processor and spreadsheet applications are the small percentage that use OS/2 for a high-end, performance-driven application, said Carter J. Luscher, an industry analyst at Gartner Group, Inc. in Stamford, Conn.

He said most sites will opt for the Windows implementation on OS/2 because it means they will be able to support a single set of applications across native Windows platforms and OS/2.

As a result, WordPerfect will focus its

desktop OS/2 efforts on its current 16-bit Windows port for OS/2 and future 16-bit and 32-bit versions of Windows that will be compatible with Ferengi, a company spokesman said.

However, the company will support a native 32-bit implementation for OS/2 with WordPerfect Office, its electronic-mail server.

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For its part, Lotus executives said the deal with IBM gives IBM more account control over OS/2 customers and allows Lotus to focus its sales staff on other

desktop platforms.

"Lotus might get some advantage from this because a lot of suite sales may be driven by the minority platform. So shops

Far from perfect

► Citing the declining price per unit of software during the past two years, a WordPerfect spokesman said the company plans to lay off an undecided number of employees in 1994.

► WordPerfect's revenue per employee dropped from \$183,000 in 1991 to \$131,000 in 1992.

► WordPerfect Chairman Alan Ashton once again denied there are any merger plans between WordPerfect and Borland International, Inc.

► The company's move to outsource DOS support has resulted in longer response times. Some internal staff was shifted back to DOS to shore up third parties.

that have Windows and OS/2 will probably favor Lotus, while shops that have Windows and Macintosh will favor Microsoft Office," Luscher said.



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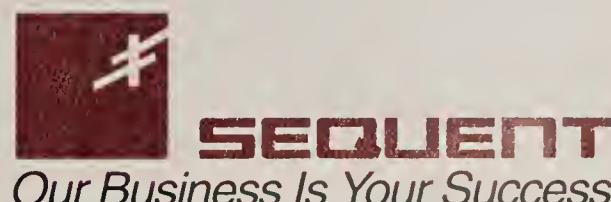
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Editorial

Point of order

As luck would have it, there was a defining moment in the conference session I was chairing last week at the huge Comdex exhibition. It came as my panelists, representing the leading network operating system vendors, debated the issue of openness, as in what and who is open.

A gentleman responsible for nearly 2,000 LAN end users spread among three operating environments — Banyan, Microsoft and Novell — rose to speak. He didn't have a question to ask as much as a lament to share.

His boss, an Air Force general, wants to know why Novell users can't talk to Banyan users, who can't talk to Microsoft users, who can't talk... well, you get the gloomy picture.

It got gloomier. What this manager wants to do is what you want to do in building distributed client/server systems. He wants to mix and match network components to take advantage of the best features each vendor brings to market.

But the noninteroperability facts of life have him thinking that his best option might be just to choose one of the major providers and go with it, if only to prevent the general from asking him, "Hey, why can't our users talk to one another?"

In truth, the panelists had no satisfying answers for this beleaguered individual and they have no immediate answers for you.

Earlier in the week at Comdex I heard Jim Cannavino, IBM's newly minted chief strategist, declare that IBM is "totally open." When asked how this pronouncement would manifest itself at corporate sites, he was nonspecific, saying that the benefits would be manifest in terms of greater value to the customer.

Meanwhile, Comdex itself was overflowing with an utterly mind-numbing array of information technologies, much of which really won't work well when hooked up to something else. It seems elementary to say, but I think more vendors ought to realize that hitching things up is what users do in a serious computing environment. Hitching things up and having them work together.

But while the leading vendors continue to lose themselves in semantical arguments about what is open, what is a standard and so forth, corporate customers seethe in utter exasperation as tensions mount and demands go unfilled in their companies.

Customers want a leader to emerge, dare I say, in the image and likeness of the IBM of old with respect to forcing order in the vendor community. They are not going to get one anytime soon. And this is causing some of them to mull some systems decisions based more upon expediency than on the open computing tenets they know they should be pursuing.

Bill Laberis

Bill Laberis, *Editor in chief*

HUMAN-CENTERED COMPUTING RESEARCH



Letters to the editor

Some say remedy, others say ruin

Regarding "Offshore programmers: Remedy or ruin" [CW, Nov. 1]: Corporate America needs to listen, watch and learn to be sensitive to cultural differences, both those represented by foreign mergers and those that emerge from changes in the domestic work force.

Pushing and taking has become our style. This style loses one very important asset — respect for the individuals who have strived, sweated and remained loyal to the end.

We need to correct, relearn and rethink our culture and consider people as well as the dollar. No one is afraid, Mr. Kruse, only concerned with tomorrow and the next lost job.

Gregory L. Sanders
Longwood, Fla.

While reading "Remedy or ruin" by Steven Kruse and Louis Buonincontri, I found both gentlemen to be correct. I've been managing computer professionals for more than 20 years and have operated an offshore programming company for seven years.

The best way to use foreign programmers is through software conversion.

Take advantage of your people's knowledge and let them do development. They know your business, the foreigner doesn't. Use the savings in cost and training to develop your shop's skills. There's minimal communication required in a conversion; the specifications are the old system.

Americans must learn to com-

pete with foreigners by continuing to maintain our technological lead. I say to both men: Merge the talents and use the skills available. Quit complaining about losing jobs. Innovate and compete.

James Rotter
President
DBMS Software Services
League City, Texas

Louis Buonincontri does not have any basis for making a comment that foreign programmers do not fully understand U.S. business terms.

I was part of a project team that worked on a welfare system in Napa, Calif. We were a staff of about 99.9% foreign programmers.

If we hadn't understood the business purpose of the programs we wrote, Napa's would not have been one of the top-ranked projects with Unisys and one of the best welfare systems to be implemented statewide in California. I strongly urge Mr. Buonincontri to do some homework before blindly bashing so-called foreign programmers.

Srikant Ramabadran
Mastech Systems Corp.
Pittsburgh

In reference to "Remedy or ruin," I can't make up my mind whether Mr. Kruse is a pimp or slave trader. Both professions make their living selling bodies and making large profits.

Phil Conrad
Data processing manager
Mechanicsburg, Pa.

Different view of job statistics

In reference to "The white man's club" [CW, Oct. 18], the statistics presented in the article can be misleading.

Willie Fields states that "... the bar has been raised." If, indeed, the bar has been raised, the new level should be applicable to all, including minorities. On the other hand, the wall represented by that level of promotion beyond which minorities could not expect to progress, as referenced by Enrique Crespo Jr., should be torn down now.

I also have a hard time with organizations with names such as "Black Professional..." or "Professional Women's..." We only hurt ourselves when we fail to take full advantage of all our human resources, regardless of religion, gender or any other categorization.

Robert F. Weber
Bridgestone/Firestone, Inc.
New Philadelphia, Ohio



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What top executives don't know can hurt you

Rebecca A. Bailin

What top corporate executives don't know about their IS investments is sometimes shocking. The CFO at a \$127 million Pacific Northwest manufacturing firm tells me his company is moving its critical processing from an IBM mainframe environment to client/server. Changes will take place over a three-year period at a cost of approximately \$4 million. "Gee," I say, "that kind of massive systems restructuring usually costs at least in the teens of millions."

He smiles a little. "That's what I've heard. I guess we're getting a good deal."

In the course of our discussion, several things become apparent: This executive has no idea that hardware costs are just a small part of downsizing; he doesn't understand how these changes will affect his business; and he believes his company can make this transition for one-fourth of what it normally costs, without incurring greater risk.

What's really appalling is that this situation

is far from unique. At another company, a mid-Atlantic transportation firm, a project involving process restructuring and redeployment to client/server had been under way for a year-and-a-half. On the weekend before the original deadline, the president of the company asked how the impending installation of the new system was looking, unaware that the work wasn't even 10% done.

These officers aren't stupid. If either received a call from a stockbroker offering a no-risk 30% return on investment, they'd hang up the phone. How then could they get caught in such a naive position with so much at stake?

Simple. Corporate managers routinely suspend normal practice when it comes to

information systems. Executives who would never approve other expenditures without a thorough understanding of costs, benefits and risks throw up their hands and either rubber-stamp projects that IS says will save money or insist on nonsensical hard-dollar benefit projections. In the latter case, IS managers often manufacture some good-looking numbers to

Corporate executives are abdicating their responsibilities when it comes to information systems, and IS managers must take part of the blame.



get on with what they know is necessary.

General managers don't need in-depth knowledge of specific technologies. They no more need to know what the OSI layers are than they need to know how to build a manufacturing line with their bare hands. They do, however, need to understand what is being proposed, how it will affect their company and what it will take for the effort to succeed. They need to understand the risks and the trade-offs and take responsibility for making decisions with imperfect information.

Corporate executives aren't the only guilty parties here. IS executives are active participants in this little game. For far too long, they have implied that, without technical knowledge, general managers cannot make informed funding decisions and must simply rely on their recommendations. This may have increased their sense of power, but it has also meant that they've had to shoulder an inappropriate level of risk and responsibility.

Managing the risk and return of an organization is something CEOs, CFOs and line managers should do. It is not a job that CIOs should be shouldering alone. Corporate decision-makers have to educate themselves and start doing the job. And IS has to wake up and support, rather than sabotage, that education.

Bailin is a consultant with Lumin Corp., specializing in technology management and executive education.

Will we ever land in Cairo?

John Gantz

Cairo, schmairo. When I listen to discussions about Microsoft's object-oriented operating system, codenamed Cairo, I have flashbacks that take me back almost 20 years.

Although the Justice Department never proved it, it was pretty clear back then that IBM had mastered the technique of announcing products that would never see the light of day simply to cause trouble for competitors. They were called "phantom computers."

I think Cairo is a phantom operating system just like Windows NT turned out to be, for all practical purposes, a phantom desktop operating system. Oh, bits and pieces of Cairo will show up in future Microsoft products, but portraying Cairo as the follow-on to Windows NT and the reason to port to the full Win32 API and the reason to embrace OLE 2.0 sooner, rather than later, is a little ingenious. There may be good reasons to do those things, but the promise of Cairo should not be one of them.

The Justice Department, Control Data and the others that sued IBM over the issue of phantom machines had difficulty proving IBM's intent. Pulling a product from market before it's shipped is not anticompetitive behavior. Never intending to ship it in the first place is.

Now I don't believe, in the hearts and minds of Microsoft's employees, there is an attempt

to portray an operating system that will never exist. So in that respect, Cairo is not a phantom system. But Microsoft, by virtue of its market share and precision marketing, has learned how to use unannounced, undeveloped products as real forces in the market.

Think you might want to develop to OS/2's distributed object model? Better factor in Cairo. Think you might be ready to switch to Unix and DCE? Better factor in Cairo. Think you might not want to wait for Novell to catch up with your enterprise network operating system? Better factor in Cairo.

Microsoft is not alone in running future products up a flagpole — What is IBM's Workplace OS but a Cairo knockoff? — but Microsoft seems the most skilled at doing so and then changing plans later without repercussions. Windows NT sold the upgrade story for Windows 3.x until Windows 3.x was so successful it didn't need an upgrade story to gain converts. Now Windows has its very own upgrade path, and NT has been repositioned as a server

operating system. Slick.

For users, there would be great entertainment value in watching Novell, IBM, Sun and others square off against a chimerical operating system if there weren't so much at stake in training programmers, writing to the Win32 APIs and waiting for the benefits of OLE 2.0 and Cairo to appear. (Sometimes I think Microsoft has three 32-bit Windows APIs simply to monopolize developer mind share.)

But maybe Murphy will intervene in our favor. If Cairo never appears as a full-fledged operating system follow-on to Windows NT, but Cairo technology finds its way into future versions of both Windows and Windows NT throughout the rest of the decade, maybe it's all for the better. We aren't ready for the object revolution yet anyway.



Cairo may turn up in bits and pieces, but the image of it as the follow-on to Windows NT is about as substantial as a desert mirage.

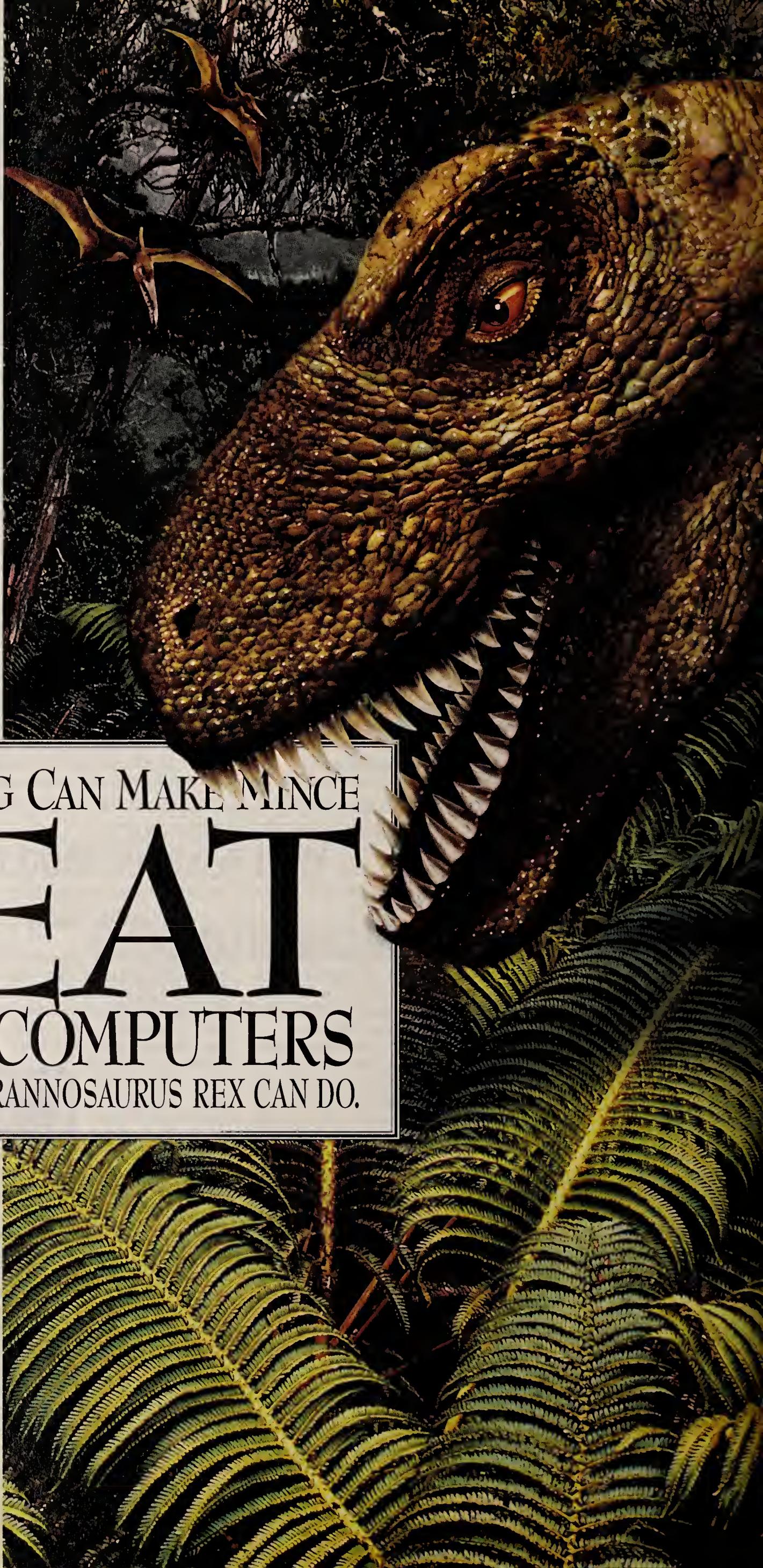
Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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Word 6.0 adds features, usability

By Garry Ray

Your training budget is skyrocketing. Users are frustrated. And here comes yet another word processor upgrade to begin the cycle all over again. Or so you fear.

However, Microsoft Corp.'s Word 6.0 for Windows should put your mind at ease. While this update includes an abundance of new features, it also offers enhancements that will make its original and newer functions vastly more accessible and effective.



Take its new Toolbar. Like Lotus Development Corp.'s SmartIcons, this array of icons can speed access to any number of functions that might normally be buried deep within menus and dialog boxes. In Word 6.0, the configurable Toolbar brings these to the forefront. What's more, you can customize the 13 context-sensitive Toolbars delivered with Word 6.0 to your heart's content by adding or deleting functions and tools.

Icon creation

Creating a custom Toolbar icon is as simple as clicking on a Word 6.0 command in the Customize dialog box and dragging the command to an existing Toolbar. A menu of icon patterns automatically appears

on the screen, and you select the one you want to apply to your custom icon. You can also create a new icon with a drawing tool. Icons are easily removed from Toolbars by dragging them off the bar.

One of the best features for information systems shops and power users is that customized Toolbars, macros and other user-defined features can be stored in network-based template files. These can be manipulated through the new Word 6.0 Organizer.

For example, a template file might contain a group of corporate document formats with specialized macros and Toolbars for fine-tuning. You could store this template on a network drive as OUR-STYLE.DOT. Then you could invoke the Organizer to copy one or more of the corporate Toolbars or macros into your own default settings template or load the entire corporate Toolbar in your normal start-up process.

Word 6.0 was designed to allow you to change any pull-down menu to your liking. If you don't like menu command Tools Options (which can easily be confused with the adjacent Tools Customize), it takes only a few mouse clicks to rename it Tools Configure Word. You can also add new pull-down menu

commands based on macros or embedded Word functions.

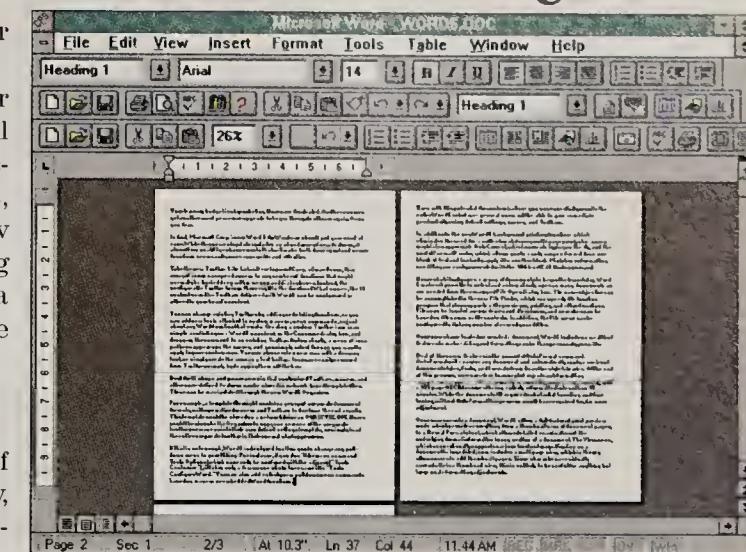
Even with this potential for customization, general users will be able to gain immediate productivity using default settings, menus and Toolbars. The new Word 6.0 background printing function eliminates the need for a coffee break during multipage print jobs.

File Finder

If users habitually open a group of documents to begin their workday, Word 6.0 makes it possible to select and automatically open any number of documents from the revamped File Open dialog box. The same objective can be accomplished in the new File Finder, a speedy file-location program that also supports a file previewer, printing and other functions. Files can be located across drives and directories.

Once users have loaded or created a document, Word 6.0 includes a wealth of features to ease editing and formatting. The powerful AutoFormat command will examine any document and automatically apply a series of document styles, fonts and formats from its active style libraries. At the end of this process, users can accept or reject each formatting suggestion.

In practice, AutoFormat is rea-



Microsoft's Word 6.0 includes customization, editing and viewing options

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sonably accurate and speedy. A 135-page ASCII document was reformatted in less than 10 minutes. While the document still required substantial tweaking and fine-tuning, without AutoFormat this process would have required far more adjustment.

Once users create a document, Word 6.0 offers a full-featured print preview mode. This provides everything from a thumbnail view of document pages to a Reveal Formats tool, which allows detailed examination of the underlying format information in any section of a document.

The View menu now includes a multipage view, which, in theory,

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Price Waterhouse to deliver object-based auditing system

Will use hypertext links, business rules

By Michael Vizard

In a move demonstrating how suites of PC applications are being used as elements of a custom application, Price Waterhouse has created an electronic auditing system composed of internally developed C++ code that runs in conjunction with databases, spreadsheets and word processing applications from Borland International, Inc. and WordPerfect Corp.

The Menlo Park, Calif., Price Waterhouse division plans to ship what it calls the TeamMate system commercially in February.

To build the system, the company used the object-oriented C++ to encapsulate PC applications as

objects within the overall auditing application. By doing this, Price Waterhouse has been able to deliver an application that incorporates hypertext links and business rules, according to Chief Technology Officer Sheldon Laube.

Easy to share data

For auditors, the hypertext capability is particularly important because every document in an audit is invariably linked to another document or a footnote, Laube said.

Scheduled to ship in February, the TeamMate system is currently in beta testing at 10 corporations, including USX Corp., a diversified energy and steel company. What attracted USX to TeamMate was

App links reign

According to a survey conducted by the Computerworld Database Division last year, application integration is becoming a more pressing purchase consideration than price. Nearly 47% of 172 companies surveyed said the level of integration is their top-ranking purchase criterion, compared with 24% who named price as the most important factor in their decision.

the hypertext links, which will allow its auditors to easily share data across applications for the first time.

"Auditors can now really share files, as opposed to working individually on their PCs," said Tom Smith, electronic data processing audit supervisor at USX.

This capability translates into less travel for supervisors, who no longer have to go to an audit site or wait for the end of the audit to do a review, and the ability for supervisors to handle larger caseloads, according to Fred Cohen, USX director of audits.

In addition, Cohen said it is easier to supervise audits because TeamMate has a built-in summarization facility that allows the supervisor to get a high-level view of the audit that flags anomalies.

"What we did was build in some business rules in the application," Laube said.

The cornerstone of the applica-

tion is the Quattro Pro spreadsheet and Paradox database from Borland and WordPerfect's namesake word processing software.

Part of plans

To take advantage of the Price Waterhouse application, USX recently moved from the Symphony integrated suite for DOS from Lotus Development Corp. to Borland Office for Windows.

In the coming year, USX also plans to take advantage of Borland's Object Exchange facility to make it easier for users to exchange data without having to pre-configure a network or electronic-mail system.

"What we've been able to do is program in a lot of the hypertext links that Microsoft talks about with OLE 2.0 and replication services across the databases. But we needed [the capability] today, so we couldn't wait for Microsoft," Laube said.

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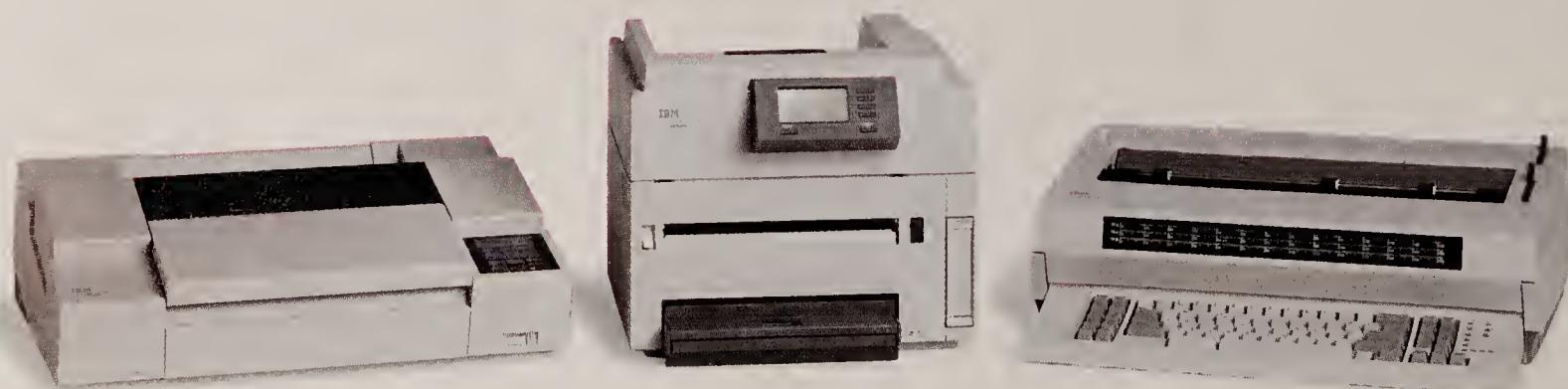
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Compaq, Duracell seek battery standards

By Michael Fitzgerald

If Compaq Computer Corp. and Duracell, Inc. have their way, notebook batteries will be getting much cheaper and easier to find.

The two companies, in conjunction with a number of other vendors, are pushing to create standard battery sizes for different types of portables, including notebooks, subnotebooks and handhelds. Currently centered on nickel-metal hydride technology, Compaq and Duracell will offer four different types of batteries, which Compaq will build into its future products.

Today, portable vendors contract with battery makers for a custom-sealed battery for each machine. Volumes are relatively low, which results in high costs. Unlike the camcorder market, which does have a standard battery size, batteries for portables can be purchased only from the vendor, not at retail stores.

Own interest at heart

Analysts reserved judgment on the initiative, saying it was possible that Compaq was trying to create standards out of its own technology.

"The one thing that makes sense is that it should lower battery prices because it gives the third-party manufacturers a way to build batteries in volume," said Janet Cole, an analyst at Dataquest, Inc. in San Jose, Calif.

Compaq and Duracell officials said their effort was made possible by indus-

try trends.

"We talked to 60 OEMs, and it looks like the architecture of several types of devices is starting to settle down," said Norman Allen, vice president of new product sales and marketing at Duracell in Bethel, Conn.

Key to the initiative, observers and vendor officials agreed, is support from

other vendor companies. While battery makers Toshiba Battery Co. and Varta Batterie AG support the plan, systems manufacturers other than Compaq are currently keeping a low profile.

Also, the world's largest portable maker, Toshiba America Information Systems, Inc., has no interest in joining the standard effort.

"For us, it's the wrong choice," said Steven Andler, director of marketing at Toshiba. Andler said that "to try fitting an industry standard battery into a machine means I can't innovate."

Toshiba, for instance, recently introduced a portable with the industry's first lithium ion battery.

AER Energy Resources, Inc. offers another battery technology called zinc air. At least four vendors plan machines around its developments.

Word 6.0

CONTINUED FROM PAGE 37

allows users to edit thumbnail pages. Because characters are virtually unreadable in a thumbnail view, the feature is unlikely to be useful for anything but large-scale formatting adjustments.

There is far more to Word 6.0 than can be described here, but suffice it to say that the word processor has been substantially overhauled. New features are both sensibly designed and well-integrated with the rest of the program.

New users will find it easy to get started with Word 6.0, and power users will find no shortage of enhancements to keep them occupied and productive.

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Midwest firms without data protection as rains begin anew

By Ellis Booker

As flooding began anew in the Midwest last week, chances were slim that businesses in the region were scurrying to alter their disaster recovery plans, if indeed they had any.

According to a recent survey commissioned by 3M Co., less than half of the 109 companies affected by the floods that swept the Midwest last spring had any kind of PC disaster recovery plan in place.

BACKUP TIPS

SIMPLE BACKUP PRECAUTIONS FOR PC AND NETWORK USERS

- ▶ Back up modified files daily — except on Friday, when a full backup should be done.
- ▶ Create at least two sets of backup data each time a backup is conducted.
- ▶ Keep at least one set of backup data off-site.
- ▶ Back up original applications.

Source: 3M Co. Data Storage Tape Technology Division

when the torrents hit [CW, April 20].

The telephone survey was conducted by Los Angeles-based Fleishman-Hillard Research, an independent division of Fleishman-Hillard, Inc.

Despite the apparent laxness indicated by the survey results, only 5% of all the firms interviewed lost any PC data because of the floods or subsequent power outages. Only 2% lost data because it was not backed up.

DAILY BACKUP NOT THE NORM

About 21% of the sites said they backed up their data in advance of the floods. But a whopping 38% of the respondents said that prior to the floods, they did not back up data on a daily basis.

Another third backed up only "some" or "none" of their data, and a slightly greater number stored most of their backup data on-site.

Interestingly, about half the businesses said individual users are responsible for backing up the data on their PCs. Floppy disks were the most prevalent backup medium (50%), followed by 1/4-in. data cartridges (19%).

The study also found that only about

one-fifth of the flood-affected businesses plan to modify their PC backup/recovery strategies. Those not planning to alter their plans gave the following reasons:

- The current plan is effective (56%).
- They had no significant problems with this year's floods (24%).
- They already back up data daily (13%).
- They already store data off-site (13%).

The top reason given by companies

that conduct only partial PC backups is that the lost "data is easy to recreate" (20%).

Among those who had a disaster recovery plan in place, the most frequent solution was to move to another location to process data (26%). Just 20% of those with a plan said they had a document that instructed staff as to who to call and what to do in the event of a disaster.

New Products

Slate Corp. has announced the Slate PenPower family of products.

According to the Scottsdale, Ariz., company, PenPower helps users take advantage of the flexibility and mobility provided by pen-equipped PCs without giving up the power of the applications they depend on every day.

Using Microsoft Corp.'s Office 4.0's open architecture, the products can integrate the functionality of pen and keyboard for enhanced input, control and navigation of applications running pen-equipped PCs. PenPower is available for Microsoft's Excel, PowerPoint and Word. PenPower products cost \$99 each.

▶ **Slate**
(602) 443-7322

Blue Sky Software has announced full support for Microsoft Corp.'s Word 6.0 for Windows with Version 2.6 of RoboHelp, its help authoring system designed for Windows and Windows NT.

According to the La Jolla, Calif., company, the product converts Word 6.0 for

Windows into a help authoring system capable of producing Windows help files as easily as it does plain text.

Features include the ability for users to create hot spot graphics, to access all of the new features of the Windows Help Engine, to automatically convert existing text into a help system or a help system into user documentation and an Error Wizard that detects potential errors.

RoboHelp 2.6 costs \$499.
▶ **Blue Sky Software**
(619) 459-6365

Storm Technology has introduced the PhotoDSP family of accelerators for Intel Corp.-based PCs.

According to the Mountain View, Calif., company, the PhotoDSP 800 and PhotoDSP 400 accelerate many commonly used Adobe Systems, Inc. Photoshop functions up to 10 times through the use of dual AT&T Digital-Signal Processors and accelerated software for performing Photoshop functions such as sizing images, sharpening edges and feathering.

The PhotoDSP 800 and the PhotoDSP 400 cost \$899 and \$399, respectively.

▶ **Storm Technology**
(415) 691-6600

COMDEX

Conner Peripherals, Inc. has announced the FilePro Advantage 810, a 3½-in. disk drive designed for advanced desktop computers, entry-level workstations and file servers.

According to the San Jose, Calif., company, FilePro Advantage 810 is a 1-in.-high drive that features an average seek time of 12 msec, an average latency of 6.7 msec and 810M bytes of formatted disk capacity.

Single-unit pricing is set at \$690.
▶ **Conner Peripherals**
(408) 456-4500

Panasonic Communications and Systems Co. has announced two multifunction optical disc drive systems and one write once, read many optical disc drive.

According to the Secaucus, N.J., company, the three drives provide enhanced memory capacity and can be used for applications that require extensive data storage. The drives come equipped with a SCSI-2 interface for multiplatform compatibility and support operating systems that include MS-DOS, OS/2, Macintosh, Unix and Novell, Inc.

Prices start at \$175.
▶ **Panasonic Communications and Systems**
(201) 348-7000

Logitech, Inc. has announced SoundMan Wave, an AT bus adapter card that supports synthesized music and digital audio recording/playback electronics.

The Fremont, Calif., company said features include FM and Wave table synthesizers, 100% SoundBlaster and Adlib compatibility, a five-channel stereo mixer, a CD-ROM interface and support for 8- and 16-bit stereo and mono files.

SoundMan Wave costs \$349.
▶ **Logitech**
(510) 795-8500

IdeaFisher Systems, Inc. has announced a Windows-compatible version of IdeaFisher, a software program.

According to the Irvine, Calif., company, the program offers a tool bar that can be fully customized, offering a choice of more than 50 different buttons.

IdeaFisher's upgrade includes Randomizer and Synchronizer, two features that provide an expanded way to view and brainstorm ideas. Randomizer uses an algorithm that combines any list of ideas. Synchronizer allows for linked control of multiple windows.

In addition, the idea associations contained in the program's idea-thesaurus component, IdeaBank, have increased by 10% to more than 775,000.

IdeaFisher for Windows costs \$199.
▶ **IdeaFisher Systems**
(714) 474-8111

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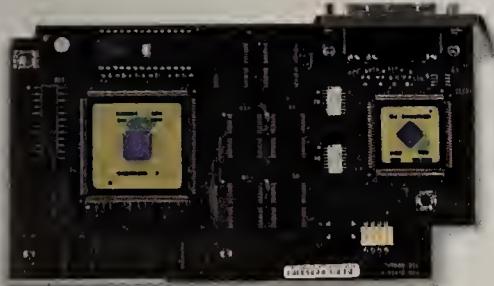
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Microsoft ships Mail gateway

Builds bridge to AppleTalk networks

By Lynda Radosevich

Microsoft Corp. released a new version of its gateway between Microsoft Mail for PC Networks and Microsoft Mail for AppleTalk users, enhancing electronic-mail swapping and adding address list exchange capabilities.

Mail for PC Networks and Mail for AppleTalk are separate products, even though both include client software that works on DOS, Windows and Macintosh computers. Microsoft is phasing out Mail for AppleTalk, and most users are migrating to Lotus Development Corp.'s CC:Mail or Microsoft Mail for PC Networks, analysts said.

Customers at a Microsoft Mail users conference in April complained that the two Mail product lines do not work well together. The gateway is meant to help unify the products and aid the migration process. The new Version 3.02 of the Mail Connection Gateway supports functions such as shared address lists and file attachments.

The gateway requires a dedicated Macintosh running System 7.1 or higher, Microsoft Mail for AppleTalk Version 3.1C or higher and AppleShare workstation software or other software that allows shared access to MS-DOS.

Microsoft said it is providing the gateway software free to Mail for AppleTalk users.

A(O)CE in the hole

Microsoft also reiterated that its future Macintosh direction will be in the form of support for Apple Computer, Inc.'s Open Collaboration Environment (AOCE). That means that products working on the AOCE platform should be able to exchange information with Microsoft Mail servers.

Separately, NCR Corp. in Dayton, Ohio, said it will offer Microsoft Mail to buyers of its StarGroup LAN Manager product at 20% off the list price of \$695 for 10 workstations. NCR and Microsoft have, since 1991, jointly developed and marketed the StarGroup software, which offers file and device sharing on TCP/IP networks.

Uniplex boosts office automation

Adds support for Windows clients

By Michael Vizard

Uniplex Integration Systems, Inc. in Houston has released Version 1.02 of its OnGo office automation system, which adds support for Windows clients, remote users, compound documents and electronic-mail packages from Microsoft Corp. and Lotus Development Corp.

In addition, Uniplex plans to make available by the middle of 1994 an add-on document management system that allows members of a workgroup to keep track of specific documents during their creation.

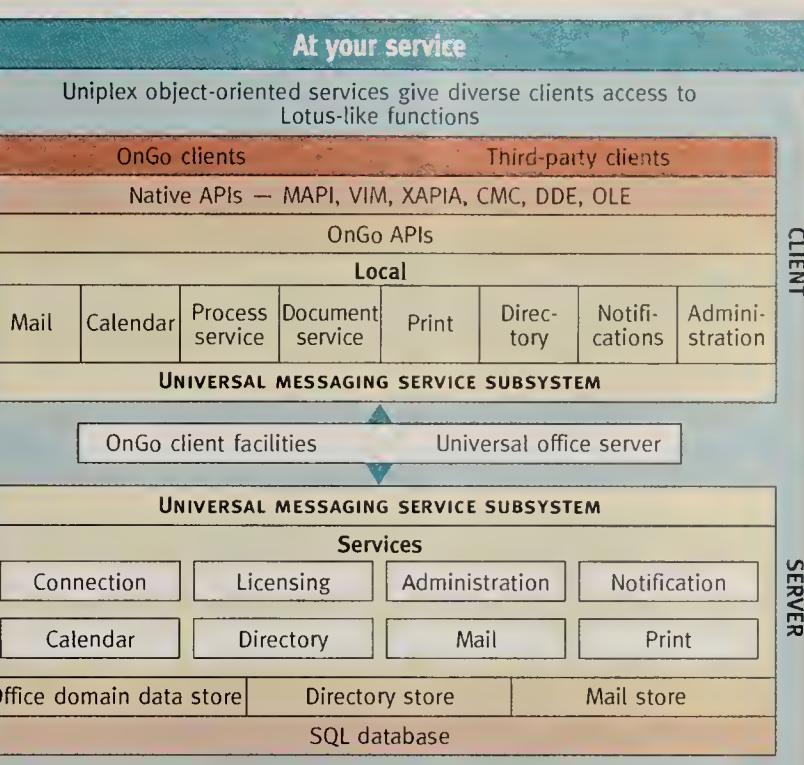
Maiden voyage

For Uniplex, the arrival of the new release marks the company's first move outside the Unix arena. As part of that effort, Uniplex will attempt to market OnGo as a client/server offering that makes use of robust

Unix servers to support PC clients.

However, industry analysts noted that the downsizing of office automation applications off the mainframe has been dominated by PC LAN environments such as Novell, Inc.'s NetWare. As a result, Uniplex will have to work hard to establish Unix as an option for customers who might naturally look to PC LANs.

"Unix is pretty well-positioned because it has a more manageable infrastructure. The PC LAN approach is full of holes," said Mike Anderson, an industry analyst at Gartner Group, Inc. in Stamford, Conn. "People talk about a workgroup-centric strategy on PC LANs, but it doesn't have



Source: Uniplex Integration Systems, Inc.

the management philosophy to back it up."

Seeking to provide a more robust systems management en-

vironment, Uniplex has layered various object-oriented modules in OnGo on top of a traditional

Uniplex, page 48

Branch automation

Madge hub card to ease remote-site management

By Stephen P. Klett Jr.

Madge Networks, Inc. has announced a server-based Token Ring hub card aimed at easing the pains associated with managing branch-office LANs.

The \$895 Smart 16/4 AT Hubcard was designed for remote, IBM SNA-based offices where managers want to install a Novell, Inc. NetWare-based LAN or integrate an isolated Novell network.

The hub card is part of Madge's branch office strategy, under which Madge will team with Novell to provide integrated products for what observers see as a market poised for fast growth.

By integrating hub functions into the branch-office server, Novell and Madge aim to provide a "LAN in a box" that will simplify LAN maintenance and manageability, reduce costs and streamline remote management.

John Depietro, an analyst at International Data Corp. in Framingham, Mass., said it was unclear if a LAN-based application could provide the same level of performance as the traditional SNA hierarchy. "Right now the separate pieces are stronger than the integrated pieces," Depietro said. "But [Madge] has a viable technology that has a lot of opportunity for growth."

The hub card is compatible with XT/AT bus or Extended Industry Standard Architecture servers and supports up to 10 Token Ring nodes connected by unshielded or shielded twisted-pair wiring. Three cards can be daisy-chained to support up to 30 users per server.

According to Madge, the Smart Hubcard automatically lo-

cates network faults, such as a malfunctioning port, and redistributes the card's work load until the problem is corrected. The card also allows administrators to remotely manage the LAN via Novell's Simple Network Management Protocol over IPX and is compatible with Novell's NetWare Management System 2.0 and Hub Management Interface.

"For the normal branch office with normal branch-office functions, this is a viable solution that shows a lot of promise," said Stan Schatt, an analyst at Computer Intelligence/InfoCorp in La Jolla, Calif.

For remote sites not hit with rapid growth and heavy transaction processing needs, Schatt said the Hubcard is a more cost-effective option than integrating the server into the hub, which vendors such as Cabletron Systems, Inc., Network, Inc. and SynOptics Communications, Inc. offer.

Too early to judge

Users were intrigued by the hub card but said it was too soon to tell if it had a place in their environments.

"It sounds like something that may be useful to us, although it may be too small to meet our needs," said Randy Shaw, senior end-user services analyst at the Federal Reserve Bank of Baltimore. The bank has five locations, the smallest having 150 users.

"While we plan to keep our [IS] service centralized, this may be a viable solution if we choose to roll out servers to our branch offices," said John Seanlon, senior network analyst at Sun Life of Canada in Wellesley, Mass. "But then how do you do backup?" he asked. "We'd probably need someone out there."

Madge said it does not expect users to warm to the LAN-in-a-box concept overnight. "People are used to thinking about routers and hubs as separate entities and will need time to familiarize themselves with [this] concept," said Patty Rowland Burke, vice president of marketing at Madge in San Jose, Calif.

Edify offers voice response in work flow

By Michael Vizard

Edify Corp. in Santa Clara, Calif., has moved to enhance its work-flow software offering with support for voice-response applications and a variety of Btrieve and SQL databases.

Version 3.0 of Electronic Workforce, which is a set of canned objects that can

be linked to automate a specific task, is intended to make it easier to automate any given task by linking objects that represent elements of that task using a point-and-click interface.

For example, TrustMark, Inc. in Charlotte, N.C., is building an automated voice-response application for banks using Electronic Workforce.

"The development environment is pretty elegant in terms of ease of use, and the applications we saw in it were pretty similar to what we wanted to build," TrustMark President Bob Van Art said.

Currently, TrustMark is using Electronic Workforce in conjunction with a Btrieve database, but the company expects to work with SQL databases in the

long term. Among the databases supported in Version 3.0 are SQL products from Oracle Corp. and Sybase, Inc. and the DB2 database from IBM.

In addition to creating applications by linking canned objects provided by Edify, developers can also use Edify's Agent trainer software to create their own objects. Also available is software for managing work-flow applications that span multiple nodes.

Pricing for Electronic Workforce starts at \$6,500 per agent and falls to \$2,050 per agent in 100-agent lot quantities. General availability of Version 3.0 is scheduled for the first quarter of 1994.

Uniplex boosts office automation

CONTINUED FROM PAGE 47

tional SQL database. These modules handle specific tasks, and data can be passed among them as part of a process that can be layered on any standard SQL database (see chart page 47).

Passing Notes

Uniplex officials claim their approach to collaborative computing, otherwise known as groupware, is an advance over Notes from Lotus because it will support multiple data types on top of a standard SQL database, as opposed to requiring information systems to adopt another database engine.

In addition, Uniplex officials noted that the object-oriented services in Uniplex are capable of converting documents across front-end systems. As such, a document created in WordPerfect Corp.'s WordPerfect for Windows can be stored in OnGo on the Unix server. And when that document is called by a Unix client, it is automatically converted into the format of whatever word processor is being used on the Unix client.

When this capability is used in conjunction with an upcoming document management system module that will handle work flow and version control, Uniplex will be able to compete more effectively in the groupware space, said Larry Warnock, Uniplex vice president of marketing.

OnGo runs on Unix servers from IBM, Data General Corp., The Santa Cruz Operation, Hewlett-Packard Co. and Sun Microsystems, Inc. Pricing starts at \$70 per user for 100 users.



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There is a new source of computing power. It's capable of executing two instructions at once. It's produced processing speeds over 100 MIPS. It's the next generation of compatible power. It's called the Pentium™ processor. And this brief will tell you how its technology is making PCs run faster today.

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2. Increase the clock speed.

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along at a measly 4.7 MHz. Today we can run at an astonishing 66 MHz—and we're still pushing for more.

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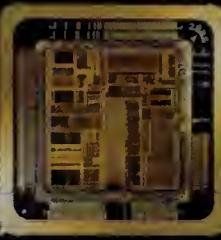


PUMPING DATA THROUGH.

The rest of the features on the processor are designed to keep that main assembly line working at peak capacity (*see diagrams*). These features, along with the superscalar technology, help the Pentium processor to crunch more than 100 MIPS at a clock speed of 60 MHz.

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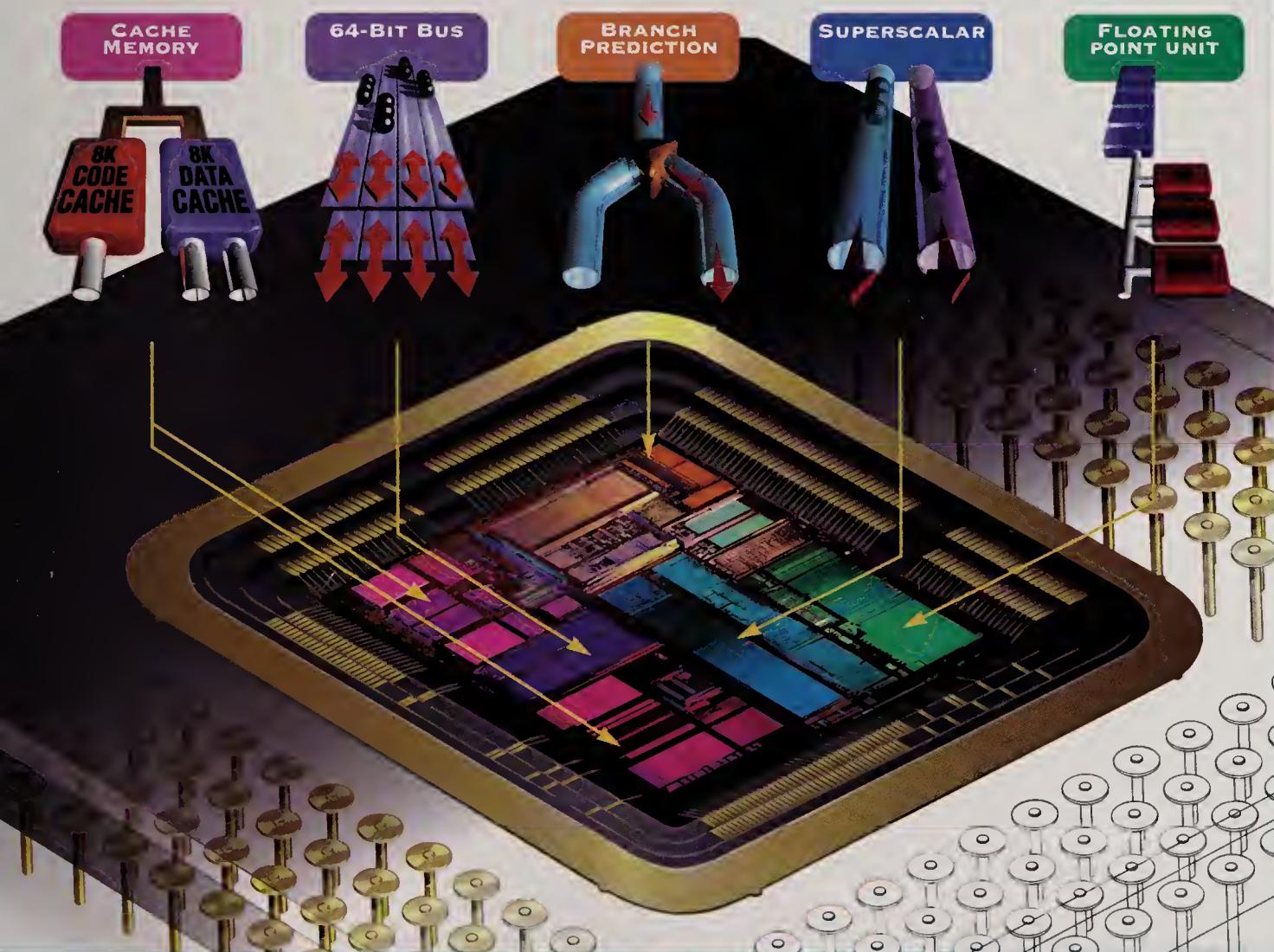
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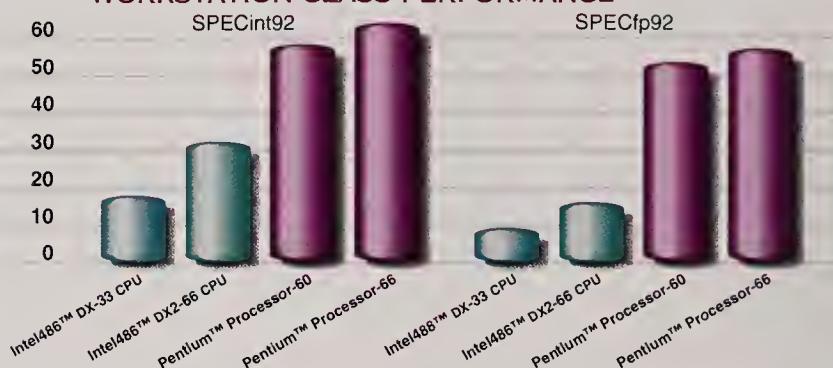
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WE'VE ADDED SPECIALIZED PIECES OF HARDWARE TO SPEED UP THE THREE MOST COMMON FLOATING-POINT INSTRUCTIONS—A MULTIPLIER, A DIVIDER AND AN ADDER. WITH THESE FEATURES, MOST FLOATING-POINT INSTRUCTIONS CAN BE EXECUTED IN A SINGLE CLOCK CYCLE, GIVING YOU UP TO FIVE TIMES THE FLOATING-POINT PERFORMANCE OF INTEL486 DX2-66 CPU-BASED COMPUTERS.

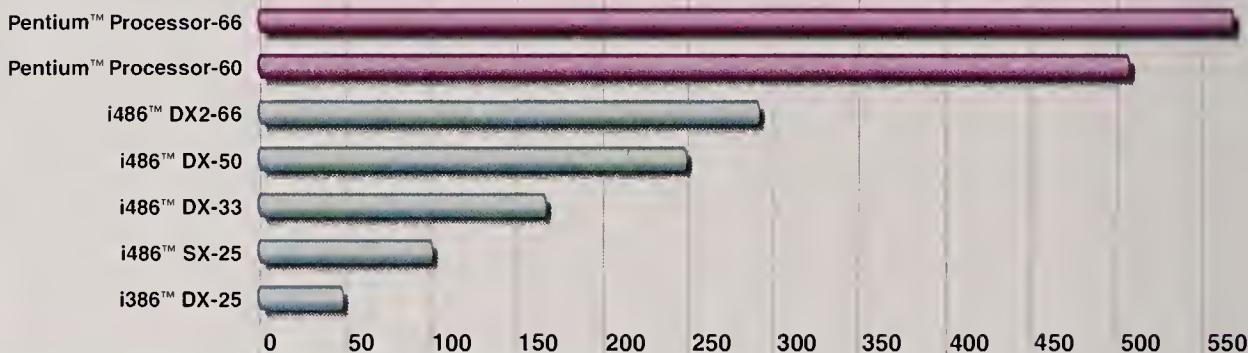


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THE INTEL iCOMP™ RATING INDEX*



*The iCOMP index is an Intel microprocessor "horsepower" rating. It is a composite of selected performance measurements from SPEC 92, ZD Bench, and Power Meter. Source: iCOMP™: A Simplified Measure of Relative Intel Microprocessor Performance, Intel Corp., 1992.

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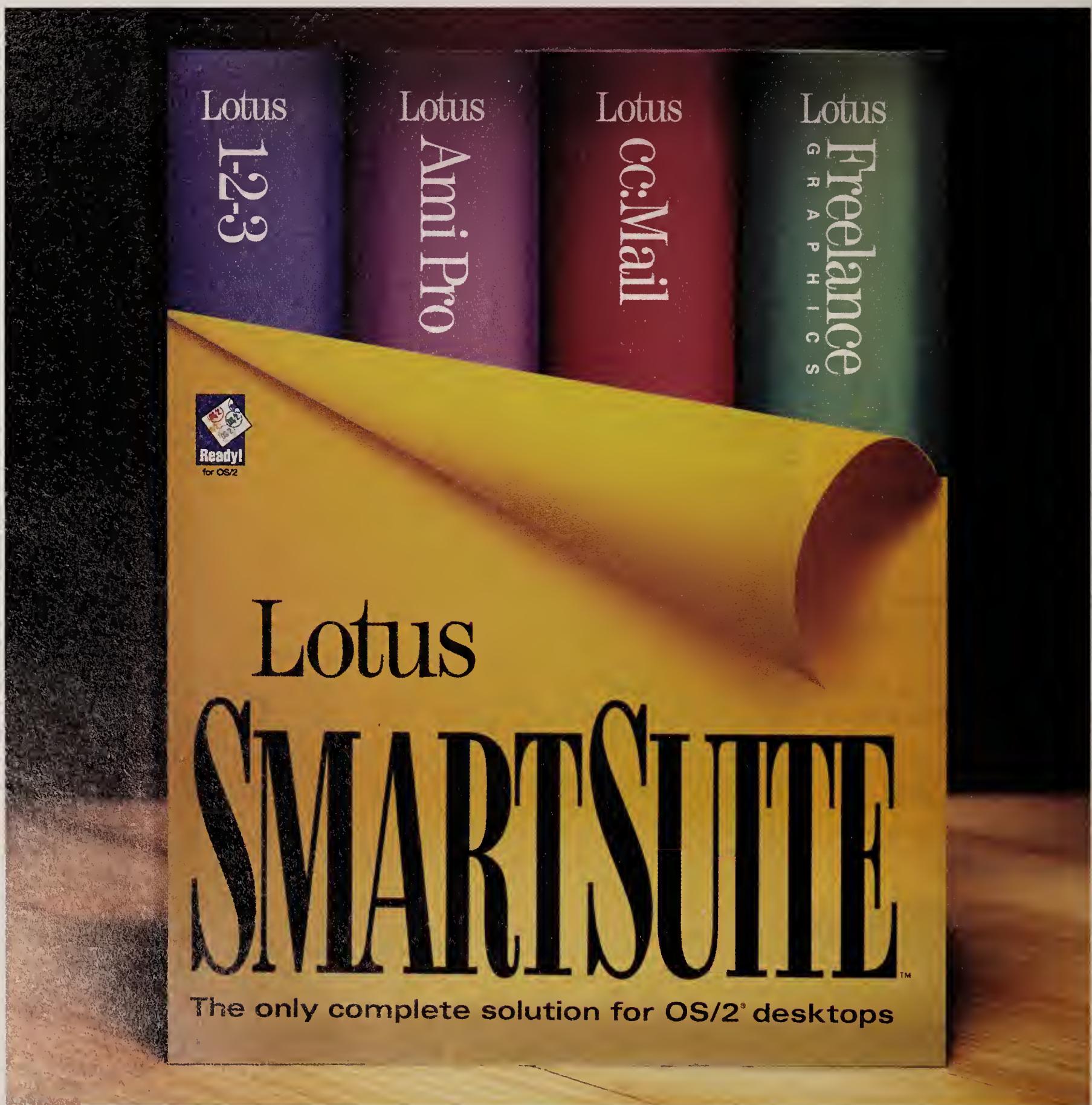
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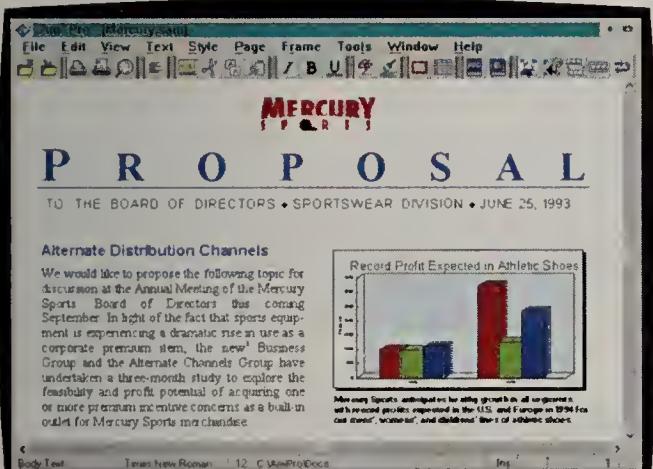
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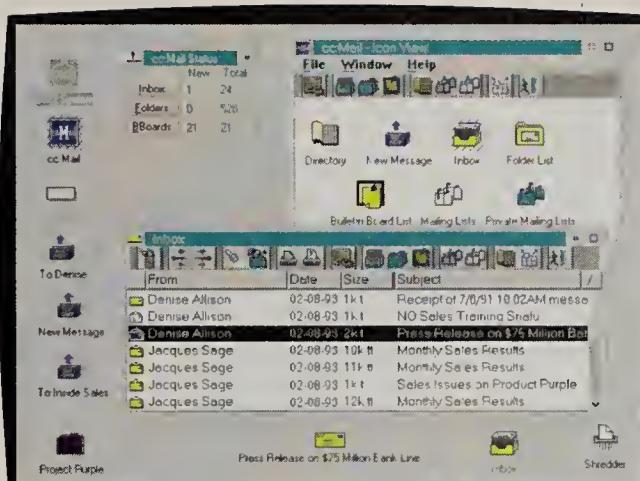
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The new Ami Pro for OS/2 word processor makes work much easier. And better looking.

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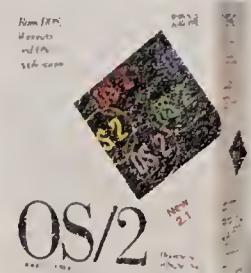
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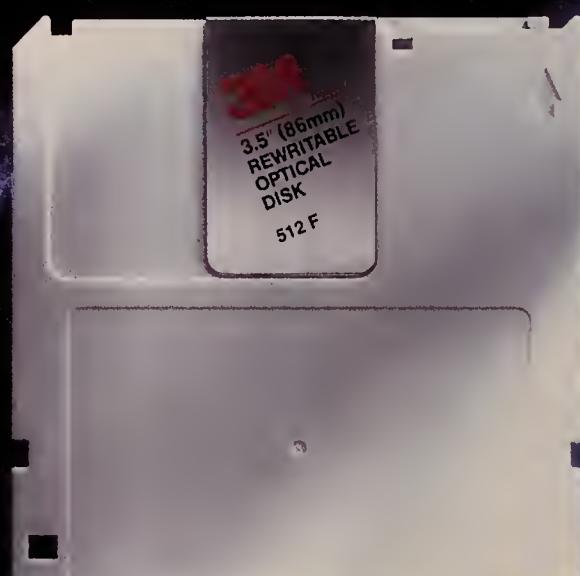
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Workgroup Computing

New Products

Raxco, Inc. has announced Version 3.0 of Security Toolkit/Unix, a security assessment tool for Unix systems.

According to the Rockville, Md., company, this version facilitates the automation of regular and systematic security checks and ensures proper security implementation across Unix networks.

Version 3.0 provides a networkwide security summary of all the specified hosts and includes numeric ratings that can gauge improvements in system security.

The product also provides a remote installation mode, modeless dialog boxes and a File Access module.

Security Toolkit/Unix is priced between \$250 and \$9,790, depending on platform.

► **Raxco**
(301) 258-2620

Wyse Technology, Inc. has announced that it is shipping The Santa Cruz Operation's MPX Release 3.0 multiprocessor extension bundled with the Wyse Series 7000I multiprocessing platform.

According to the San Jose, Calif., company, the Series 7000I offers a linearly scalable multiprocessing operating system and server platform with automatic CPU load balancing and dynamic disk caching.

The Series 7000I employs a 64-bit wide, asynchronous zero-wait state bus and can use the maximum performance levels of Intel Corp.'s i486 processors.

The Wyse server can accommodate up to 250 users.

Prices start at \$14,695.
► **Wyse Technology**
(408) 473-1200

Pillar Corp. has announced FyPlan Version 1.5, client/server budgeting and forecasting software.

The Foster City, Calif., company said it added a number of dimensions in which a budget can be reviewed and analyzed and that FyPlan is fully interoperable in both Windows and Macintosh environments.

Pricing for FyPlan 1.5 starts at \$19,500 for a five-user system.

► **Pillar**
(415) 349-6200

Sequent Computer Systems, Inc. has announced the WinServer 500, an entry-level member of the WinServer family of application and database servers running Microsoft Corp.'s Windows NT.

According to the Beaverton, Ore., company, WinServer 500 was designed for use as a departmental database server or LAN consolidation server, or for small workgroups.

The system includes 24M to 384M bytes of memory with parity checking, disk storage ranging from 1G to 18.9G bytes, two integrated fast SCSI channels and Windows NT Advanced Server pre-installed.

Prices range from \$13,200 for the base

configuration to \$61,900.

► **Sequent Computer Systems**
(503) 626-5700

Mobius Computer Corp. has added three high-performance graphical workstations to its Mirage Series of SPARC/10.

According to the Pleasanton, Calif., company, the Mobius Mirage IPS/10 Model 51 is a 100%-compatible clone of Sun Microsystems, Inc.'s SPARCstation 10 Model 51; it can be field-upgraded to the

multiprocessing models.

The IPS/10 Model 52 is a clone of Sun's dual-processor, SPARCstation 10/52 and offers a TurboGX+ graphics accelerator with 1,600-by 1,280-pixel resolution.

The IPS/10 Model 54 is a clone of the quadprocessor, SPARCstation 10/54, and also provides the TurboGX+ graphics accelerator.

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Before You Commit To High Availability Computing, Maybe You Should Take A Closer Look.

First, the bad news. No matter what you've read, heard or hoped, high availability solutions are not what they appear to be. If you're dealing with critical, large transaction volume applications, high availability systems simply can't protect you from downtime. They might recover eventually. But recovering is not the same as not failing. And the real cost of computer downtime to American business is staggering. In terms of lost revenue. In terms of lost productivity. In terms of lost data. In terms of lost customers.

And the news gets worse. Even if high availability were a proven solution for mission-critical applications in other respects, which it's not, it runs on garden variety UNIX®. Based on that alone, its reliability has to be questionable.

If you're looking for availability in an open system, be prepared for another disappointment. The special programming a high availability solution requires almost always turns it into a proprietary system. No one can tell you what it's really going to cost to implement or how many vendors it will take.

And when the system fails, who do you call? The hardware vendor? The software vendors? Your consultants? It all gets very, very complicated, very, very fast.

Now, for the good news. Stratus® is exactly what it appears to be. A complete, proven solution that delivers continuous availability for critical, large transaction volume applications. Not high availability. Continuous availability. And

when you're dealing with mission-critical applications, you can't afford anything less.

Stratus is also simple and easy to install and maintain. Unlike high availability systems, Stratus requires no special programming or system administration. You won't have to hire consulting or software firms to configure Stratus for availability. You won't have to pay for two or more software licenses.

Since Stratus delivers true continuous availability with FTX® (Fault-Tolerant UNIX operating system), UNIX SVR4 enhanced for availability, you'll also have something else no high availability solution can give you. A truly open system that delivers continuous availability that's completely transparent to both users and programmers.

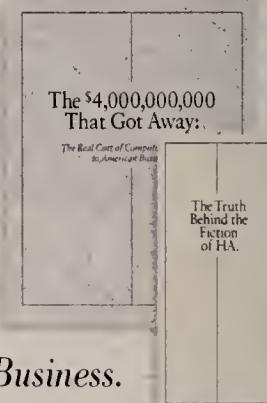
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Think fast, and apply the V.F 28.8 wherever you need high-speed data transfer or file transmissions, remote LAN access, high-resolution imaging, and effective Windows-based telecommuting. All over public phone lines instead of costly leased links.

And like other GDC products, the V.F 28.8 supports all major global standards for maximum connectivity and flexibility.



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SEE US AT COMNET '94, BOOTH #1418.

ISDN access provides cheaper Internet links

By Joanie M. Wexler

As the use of TCP/IP and the corporate quest for broader connectivity continue to accelerate, network service providers are coming up with new ways to deliver commercial access to the Internet.

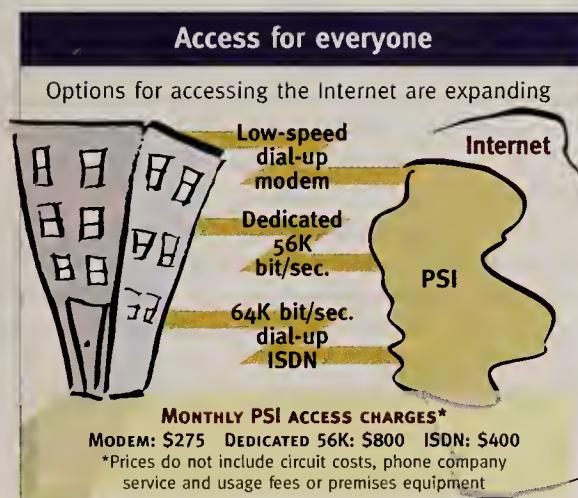
The 62-country "network of networks," which supports an estimated 20 million users, is quickly becoming a cornerstone connectivity vehicle for global data communications.

To make the Internet more accessible to nontechnical users, Performance Systems International, Inc. (PSI) recently began providing basic-rate Integrated Services Digital Network

(ISDN) Internet access in 30 cities. The 64K bit/sec. dial-up digital access should help companies save money by enabling them to dispense with dedicated, though often idle, Internet access links.

Called LAN-ISDN Service, PSI's \$400-a-month offering plugs the current access gap between low-

ISDN, page 58



Asynchronous Transfer Mode

AT&T sets launch for '94

By Joanie M. Wexler

AT&T recently became the latest interexchange carrier to introduce Asynchronous Transfer Mode (ATM) services.

The company said it will begin a controlled introduction of its InterSpan ATM Service during the second quarter of 1994; general availability will follow in the second half of the year.

Although the announcement means that full-blown services might not be available for another year, the industry will not be left wanting, said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy.

Today, ATM is only about a 20-customer market, and the needs of that market can be satisfied by AT&T's controlled introduction, he said.

T1 speeds

Initial AT&T ATM services will run at T1 (1.5M bit/sec.) and 45M bit/sec. rates. Some controversy surrounds the usefulness of ATM at T1 speeds because of its associated 20% overhead. However, that figure drops to 10% at T1 rates because ATM packs cells onto those

links more efficiently, said Bob Cole, a technical staff member at AT&T/Bell Laboratories.

AT&T issued only sample pricing. Flat-rate pricing for Class C service, which handles bursty data, serving a three-node network with sites in New York, Chicago and San Francisco, would be \$94,500/month for a 7.5M bit/sec. guaranteed aggregate network speed. The same network would cost \$115,200 at 34M bit/sec. Prices include access charges.

Voice, video supplements

Jayne Fitzgerald, AT&T's InterSpan product line director, said she expects users to incrementally add voice and video applications to their data. Voice and video, which require predictable, constant bit rates, will run over Class A links, which are priced based on connection distance.

On the ATM path, AT&T trails MFS Datanet, with its ATM-based LAN interconnect service, and WilTel, which offers a channel extension service over an ATM backbone. Sprint Corp. has announced service, and MCI Communications Corp. has yet to reveal its ATM plans.

Multimedia intros

Video for the desktop plays to full house at trade show

By Elisabeth Horwitt

Technology for delivering full-motion video to PCs throughout the enterprise achieved commercial reality at last week's Comdex/Fall '93 show in Las Vegas with a bevy of product debuts.

Uses for such products include videoconferencing, companywide distribution of training and other video materials and the ability to illustrate or otherwise complement with video clips charts and reports generated by popular PC packages.

COMDEX

Among the more notable announcements was IBM's Ultimeda Video IN/2, software that is said to enable users of IBM's OS/2 Version 2.1 to capture images off regular video equipment, such as camcorders, and then run, edit and merge it with other PC software.

A user could embed a video file in an electronic note and send it to a group of users via an OS/2 electronic-mail system, or the user could embed a video clip in a report generated by a standard PC application such as Lotus Development Corp.'s 1-2-3, an IBM spokesman said.

IN/2 is said to support a wide range of video-capture cards. It is scheduled to ship next month, priced at \$199, IBM said.

IBM and the Indiana University School of Music demonstrated an application the school is building called the Variations Music Information System. The system will allow students and faculty to use a workstation to directly access the university's library of 121,000 recordings and 365,000 books and scores.

Users can then download video and sound objects for listening and editing using Ultimeda Server, according to IBM spokeswoman Deborah Stoll. The university hopes to have the application running when a new library complex opens in early 1995.

IBM also announced Windows and Macintosh clients for Ultimeda Server/6000, its RS/6000-based multimedia server, which also supports OS/2.

Tenfold increase

The U.S. market for networked multimedia desktop applications will shoot up from \$201 million in 1993 to \$2.46 billion in 1996, according to a recent report from Ovum Ltd., a British research firm. During the same period, sales of videoconferencing systems will stay pretty flat, going from \$248 million in 1993 to \$256 million

in 1996, the report stated (see chart).

The explosion of networked desktop multimedia depends on the merging of affordable desktop video delivery systems with local- and wide-area network technologies such as compression; and a wide-area communications infrastructure that can handle such bandwidth-hungry applications, Ovum said.

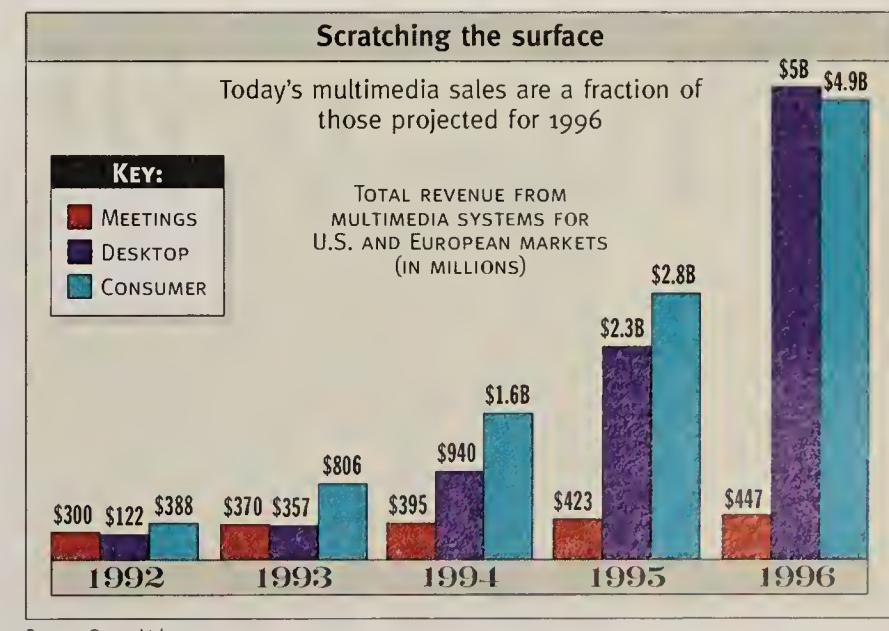
The more the merrier

Other announcements at Comdex included:

- Peregrine Systems, Inc. in Carlsbad, Calif., announced NTV, multimedia software that is said to provide Windows users with desktop videoconferencing and the ability to share live information displayed on-screen.

NTV is said to support virtually all commercial multimedia hardware. It is based on Microsoft Corp.'s Video for Windows. The product transmits 10 to 22 video frames per second. It works on Ethernet and Token Ring LANs and most major network operating systems.

NTV will be licensed to OEM hardware partners and is scheduled to ship in January. Peregrine estimated that the system, including video-capture board, audio board, speakers and camera, will sell for as little as \$500.



Source: Ovum Ltd.

- Acer America Corp. in San Jose, Calif., demonstrated a \$6,000 486-based PC that is said to convert a PC into a videoconferencing and document-sharing system.

- Zeos International Ltd. in Minneapolis announced the immediate availability of multimedia upgrades across its DOS and Windows workstations. A Zeos system based on an Intel Corp. i486DX2 66-MHz microprocessor with 8M bytes of high-speed RAM is priced at \$2,890, Zeos said.

- Dell Computer Corp. in Austin, Texas, announced it would become the first systems manufacturer to bundle Sigma Designs, Inc.'s ReelMagic MPEG full-motion playback controller with its products. ReelMagic is said to allow PC-compatible computers to play back up to 72 minutes of full-screen, full-motion video and CD-quality digital stereo from a CD-ROM.

Briefs**ATM migration service**

AT&T/NCR has introduced UniverCell Professional Services for ATM, a professional services program in the U.S. for customers seeking to create migration strategies to Asynchronous Transfer Mode (ATM) technologies.

Vendors fight over patent

InterDigital Technology Corp. in King of Prussia, Pa., and Motorola, Inc. have been trading patent suits over "time division multiple access," InterDigital's technology that sends multiple conversations over a single channel in a digital system. In the most recent action, InterDigital filed a suit against Motorola in U.S. District Court for the Eastern District of Pennsylvania claiming that the manufacture, use and sale of Motorola's digital wireless telephones and subscriber units violates its patents. Two weeks earlier, Motorola asked a district court in Delaware to declare that its cellular products do not infringe on InterDigital's patents. Motorola said it firmly believes "that the application of InterDigital's patents to digital cellular systems is without merit" and that those patents are invalid and unenforceable.

ISDN: Cheaper access to Internet

CONTINUED FROM PAGE 57

speed dial-up modems and dedicated links.

"If there were a cost-effective alternative with better bandwidth, we'd be interested," said Bill Conley, manager of corporate information systems at Loral Aerospace Corp. in Newport Beach, Calif. Today, he said, many non-technical users have joined Loral's engineering network "just so they can get access to the Internet," which is provided by a regional Internet subnet-work called BARRnet.

Another option

Loral's engineering network links to BARRnet through a Cisco Systems, Inc. router. "But smaller divisions that can't afford a Cisco might like to get on" via a high-speed switched service, Conley said.

Tony Rutkowski, vice president of the Internet Society, the Internet's global administrative body, said the swelling interest in commercial Internet use has two primary drivers. People want into the Internet because "you basically aren't practicing your profession these days" without a connection. Companies need to reach cus-

tomers, suppliers and peers and can participate in countless standards bodies and other activities, through the Internet, he explained.

From a technical perspective, "operating systems are becoming TCP/IP-ready on a massive scale," so users are automatically "at the plug-and-play stage" with the technology, Rutkowski said.

"If ISDN is available in your local area, [the PSI service] is a very reasonable alternative to a leased 56K bit/sec. line," PSI's other high-speed alternative, said Steven A. Taylor, president of Distributed Networking Associates, a Greensboro, N.C., consultancy. One reason is that most Internet traffic is sporadic, leaving high-speed leased lines idle some of the time, he said.

Rutkowski, however, who is also director of technology assessment at Sprint Corp., another provider of commercial Internet access, said Sprint is not offering ISDN access "because the cost/performance ratio is not there. I don't know of any RBOC [local telephone company] that has priced ISDN anywhere near a leased line."

He said that Sprint plans dial-up

switched digital access of some sort.

Sprint now offers leased-line Internet access from 19.6K bit/sec. to T1 (1.5M bit/sec.) speeds. The carrier also offers a dial-up 800 Internet access service for nomadic users and is rolling out DS3 (45M bit/sec.) dedicated access, Rutkowski said.

Sprint announced last week that it would offer DS3 rates in its backbone in the first quarter of next year in anticipation of taking on some Internet transport.

What's it cost?

PSI's service has a onetime \$500 fee, plus a \$400-per-month price tag. That cost does not include monthly telephone company ISDN service charges (usually about \$30) or any metered usage charges (see chart page 57).

PSI's service is founded on dial-up router equipment from Ascend Communications, Inc., a remote-access and inverse multiplexer vendor in San Francisco. Companies wishing to use LAN-ISDN Service need either an Ascend Pipeline 100 access router or Point-to-Point Protocol communications software from Sun Microsystems, Inc. or Morning Star Technologies running on a LAN-based Sun workstation.



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The new line of HP ENVIZEX stations is shaking other X terminal makers with its sophisticated features, raw speed and low prices.

It offers unsurpassed multimedia readiness and PC interoperability, with an internal floppy drive, scanner support and CD-quality audio. A selection of local clients are also available.

Typical cost: \$4,695* for the 165,000 Xstones, 19" color X station. No wonder we're the world's #1 X terminal vendor.[†] For more details, call 1-800-637-7740, Ext. 7881. In Canada call 1-800-387-3867, Dept. 2308. Then get your company on a roll.

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*CD-quality audio, local scanner support and internal floppy drive available as options. Speakers not included. [†]International Data Corporation, X Business Group, January 1993, by sales revenue.

New Products

Thursby Software Systems, Inc. has introduced TSSnet for Sun Microsystems, Inc.'s Solaris operating system.

According to the Arlington, Texas, company, systems can coexist with other networks while TSSnet is running Digital Equipment Corp.'s DECnet; the product also provides network terminal and printer support under Local Area Transport protocol.

TSSnet for Solaris costs \$1,995.

► **Thursby Software**
(817) 478-5070

CNet Technology, Inc. has introduced the PCI Ethernet adapter card, a product that will support Intel Corp.'s Peripheral Component Interconnect (PCI) local-bus architecture.

According to the San Jose, Calif., company, the low-power card fully supports ANSI 8802-3, IEEE 802.3 and 10Base-T connection in Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT, Windows LAN Manager and The Santa Cruz Operation's Unix environments.

Features include an independent 10-MHz serial clock and a PCI system clock that operates at speeds up to 33 MHz.

The card also provides address filtering modes.

A Direct Memory Access (DMA) chan-

nel is not required because the card has its own DMA engine.

The adapters cost \$399.
► **CNet Technology**
(408) 954-8000

Digicom Systems, Inc. has introduced a V.32terbo software upgrade package for the Connection Series V.32 internal data and fax modems.

According to the Milpitas, Calif., company, the package offers software based on digital signal processing technology and exclusive firmware algorithms to achieve full-duplex V.32terbo data transfer rates.

The upgrades are compatible with Digicom's modem Connection 96+ and other products in the Connection series.

The upgrade package costs \$49.95.
► **Digicom Systems**
(408) 262-1277

Solectek Corp. has introduced AirLAN/PCMCIA, a member of its AirLAN wireless Ethernet product family.

According to the San Diego company, the product was designed for use with PCMCIA-equipped notebook computers, providing mobile LAN connections that allow users to move about their workplace free from power cords or network cables.

AirLAN operates at 2M bit/sec. and supports all major network operating

systems, including Artisoft, Inc.'s LANtastic, Novell, Inc.'s NetWare and Microsoft Corp.'s Windows for Workgroups.

The product uses spread spectrum 915-MHz radio technology to pass data through walls, ceilings and floors. Line-of-sight operation is not required.

AirLAN costs \$699.
► **Solectek**
(619) 450-1220

Fluke Corp. has introduced the 672 Ethernet LANMeter test tool and the 675 Combo LANMeter test tool for Token Ring and Ethernet LANs.

According to the Everett, Wash., company, the 672 and 675 allow for fast and portable network troubleshooting by diagnosing the most common problems and isolating faults on the physical media and adapter cards.

The instruments offer troubleshooting capabilities such as "LAN-at-a-Glance" LEDs, collision analysis and Novell, Inc. and TCP/IP traffic analysis.

The 672 Ethernet LANMeter costs \$5,995; the 675 Combo LANMeter is priced at \$8,995.

► **Fluke**
(206) 347-6100

Chipcom Corp. has introduced two Windows versions of Ondemand Network Control System (NCS) network management software.

According to the Southboro, Mass., company, Ondemand NCS for Windows extends the management capabilities of Chipcom's Unix-based Ondemand NCS package to the PC platform.

Ondemand NCS for Windows software offers key information for tracking network problems and locating performance bottlenecks. It can be configured "on-the-fly" to balance network loads.

Ondemand NCS for Windows is available in two versions: a portable version that operates as a stand-alone product and a desktop version that is bundled with Hewlett-Packard Co.'s HP OpenView network management platform.

The portable version of Ondemand NCS for Windows is priced at \$895, and the desktop version is available for \$2,995.

► **Chipcom**
(508) 460-8900

Product short

Eicon Technology Corp. has announced its WAN Services for Windows NT, a product designed to provide wide-area network support for all Microsoft Corp. Windows NT communications programs in a single package. Users can connect WANs through X.25 packet-switched networks and Synchronous Data Link Control lines worldwide. Cost: \$595. Eicon Technology, Dallas (214) 239-3270.

petition.





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**Client/Server
Solutions**

**Workgroup
Solutions**

**Object Computing
Solutions**

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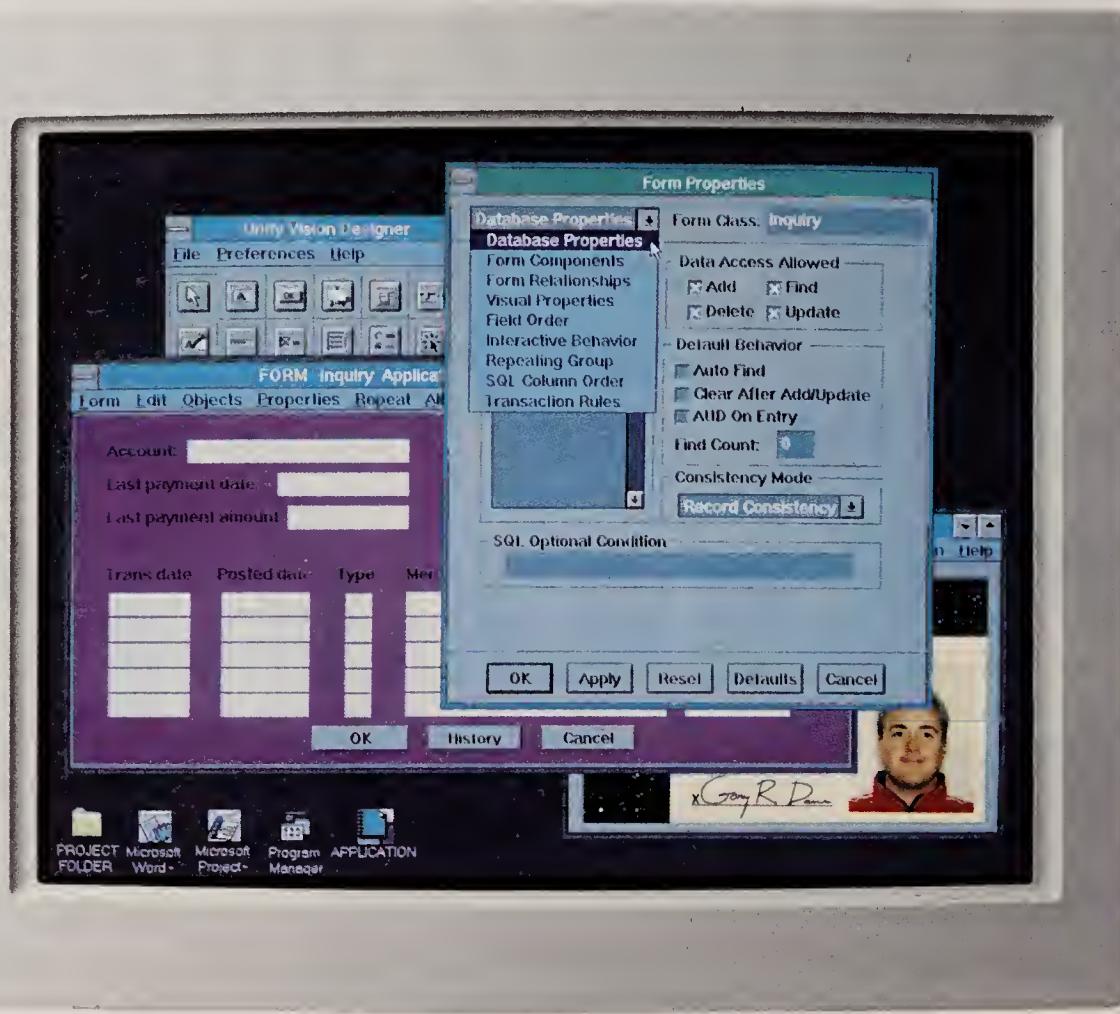
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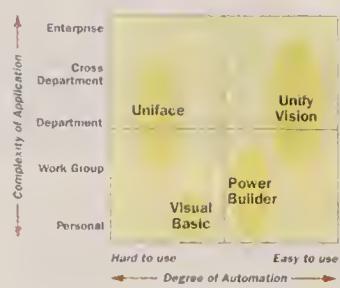
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The Smart Tools Company

Host-tracking package helps rein in software costs

By Johanna Ambrosio

Turning a critical eye toward software costs is the politically correct thing to do these days, and a package from Isogen Corp. can help.

Called SoftAudit, the mainframe-based package monitors and tracks all of the other software on the host. The product helps users determine which products are on the mainframe, which are being used often and which can be retired.

"Over the years, people add software to the system, and you don't necessarily know what you have after a while or even which files belong with what," said Robert Baritz, president of the New York vendor. SoftAudit tracks all load modules on the mainframe and matches them up with whatever products they belong with. SoftAudit also monitors actual use of the products. A reporting facility is included.

Introduced in August, SoftAudit



has some 40 customers. Michael Bryant, a senior systems specialist at Blue Cross/Blue Shield in Eagan, Minn., said he figures SoftAudit will save the company at least \$150,000 annually. Part of the savings will accrue from eliminating the maintenance on one little-used package, and the rest will result from taking a package completely off the system.

"And this is just scratching the surface," Bryant said. "I know there's double or triple that amount that we can save."

Other reported benefits include saving disk storage space by removing software that is used little or not at all and cleaning up software that has been stored in many libraries. This will result in easier maintenance. SoftAudit also has the ability to verify software-license compliance by checking to see where the software physically resides.

Jim Manning, a systems pro-

Host-tracking, page 64

mittee on information policy, said recently that he will forge ahead with his plan to write medical privacy legislation as part of the health care reform package.

Condit held a hearing on the topic Nov. 4, setting the stage for introducing a privacy bill in December and enacting it next year.

The Clinton plan calls for the new National Health Board to get public input and prepare a privacy bill within three years.

"Writing privacy legislation is complicated, and [the Clinton task force] didn't have time to do it, so they provided an outline of privacy legislation and figured to fill in the details later," a congressional source said.

Even critics acknowledged, however, that the Clinton plan provides a good blueprint for strong privacy legislation that would preempt the "crazy quilt" of differing state laws [CW, Aug. 9].

Sun offers in-house tools

Suite developed to move its own IBM applications to Unix

By Jean S. Bozman

Sun Microsystems, Inc. will sell users a suite of software tools it developed in-house to provide interoperability between its own IBM-compatible mainframe and Unix systems. The systems management tools will be sold as part of the SunIntegration Services unit's re-engineering and consulting services.

The five components of the Sun Enterprise Toolset package are SunDANS (Distributed Administration of Network Software), which automatically distributes software, updates and bug fixes; SunRAI (Remote Application Interface), which allows Unix systems to synchronize database transactions with mainframes; Sun Paperless Reporter, which electronically distributes documents in mixed-vendor networks; Sun ConsoleServer, which lets one systems administrator control many remote servers; and Sun DataCenter Scripts, which help manage multiple database systems.

Fraction of the code

Prices for the server-based modules, which were announced this month, range from \$4,500 to \$20,000. The packages contain only 25% of the downsizing code Sun developed for its own four-year project, said Bill Coleman, SunIntegration's general manager.

Users at many large Sun sites said they in-

tend to keep their legacy applications for years. "There's a huge investment in IBM systems for MIS [in general], and the migration to client/server Unix systems is going to be expensive and time-consuming," said David Wasley, director of data communications and network services at the University of California at Berkeley.

"The complexity of integration is such that you will require special tools," he said. The public university has IBM-compatible mainframes and some 14,000 network devices, including about 2,000 Sun workstations and servers, Wasley said.

Mainframe countdown

Sun's modules were developed internally as part of a 1989 effort to downsize many of its mainframe applications to run on Sun Unix servers and relational databases. Sun plans to turn off its outsourced mainframe in 1995.

"We took the glass house and extended it around the world," said Harris Kern, manager of Sun's data center in Milpitas, Calif. "By redeveloping the tools, we are able to manage and control the distributed environment the same way we would control the data center." But users on Sun's 23,000-node global network had to give up their traditional Unix "root" access for security reasons and are using the central-site security system instead, he said.

Privacy key to public trust in health care reform

By Mitch Betts
WASHINGTON

■ President Clinton's health care reform proposal calls for enactment of strong medical privacy legislation within three years, but critics say that is not soon enough.

Making privacy seem like an afterthought will breed public distrust at a time when the public already is skeptical about the ability of government and business to keep sensitive data confidential, according to interest groups ranging from hospital administrators to the American Civil Liberties Union (ACLU).

Because the reform plan envisions computerized patient data flowing straight from doctor's offices to regional health alliances and insurers, "getting one day into health care reform without privacy safeguards is very dangerous," said Janlori Goldman, director of the ACLU's Privacy & Technology Project in Washington.

A part of the package

The U.S. Congress is not likely to wait three years anyway. Rep. Gary A. Condit (D-Calif.), who chairs a House subcom-

mittee on information policy, said recently that he will forge ahead with his plan to write medical privacy legislation as part of the health care reform package.

Condit held a hearing on the topic Nov. 4, setting the stage for introducing a privacy bill in December and enacting it next year.

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"Writing privacy legislation is complicated, and [the Clinton task force] didn't have time to do it, so they provided an outline of privacy legislation and figured to fill in the details later," a congressional source said.

Even critics acknowledged, however, that the Clinton plan provides a good blueprint for strong privacy legislation that would preempt the "crazy quilt" of differing state laws [CW, Aug. 9].

The president's proposed Health Security Act includes the following provisions:

- Each person's health care card will have a unique identification number for accessing electronic records. The number cannot be used for purposes outside the health care system, and there are criminal penalties for misusing the number or card.
- Patients must consent, in writing, to any disclosures of medical records, and they have the right to see (and correct) their own records.
- The health board will create a 15-member advisory council on data processing and privacy policies.

Within three years, the health board must submit a more comprehensive privacy bill.

- Using patient data for employment decisions or insurance risk assessments is prohibited.

"Insurers can't use the information [about medical conditions] for risk-adjusting you out of the plan. That's what happens today, and that's why people lose health insurance," said John S. Silva, co-chair of the information systems working group of Clinton's reform task force.

Public opinion

The importance of medical privacy was underscored by the release of a national opinion poll indicating high levels of public support for medical privacy legislation that has features similar to the ones in Clinton's proposal.

Furthermore, a sizable minority of Americans (27%) reported that their medical information had been disclosed improperly.

Alan F. Westin, a privacy expert at Columbia University in New York and director of the study, said the privacy of computer-based medical records will be the "litmus test" on whether the public can trust information technology. Because the public is not in a very trusting mood, according to Westin, the "policy-makers will have to go an extra mile-and-a-half to provide safeguards, enforcement and penalties."



Source: Louis Harris and Associates, Inc., New York, and Equifax, Inc., Atlanta

Ross shows latest version of Promix

Ross Systems, Inc. recently introduced a new release of its Promix process manufacturing software that adds several features targeted at users in the chemical, pharmaceutical and food and beverage industries. Site licenses start at \$400,000.

Promix Version 3.0 initially supports Digital Equipment Corp.'s VAX and Alpha AXP systems and Hewlett-Packard Co.'s HP 9000 and HP 3000 machines. Ross Systems in Redwood City, Calif., said it also plans to support IBM's RS/6000 line and Microsoft Corp.'s Windows NT operating system in the future.

Added functionality includes a sales-forecasting module and controls for managing the development of process specifications and automatically scaling recipes and formulas to account for the potency of the materials being used.

The software is written in Gembase, the company's fourth-generation language, and it can be integrated with its financial, human resources and distribution applications. Promix supports both character terminals and PCs with graphical user interfaces, but it remains a host-centric product for now, a Ross spokeswoman noted.—*Craig Stedman*

Host-tracking

CONTINUED FROM PAGE 63

grammer at the Federal Deposit Insurance Corp. in Arlington, Va., said he is using only the inventory-tracking part of SoftAudit and has not yet put the use-monitoring portion into effect. He said his organization is building a database of products that are on the system; the

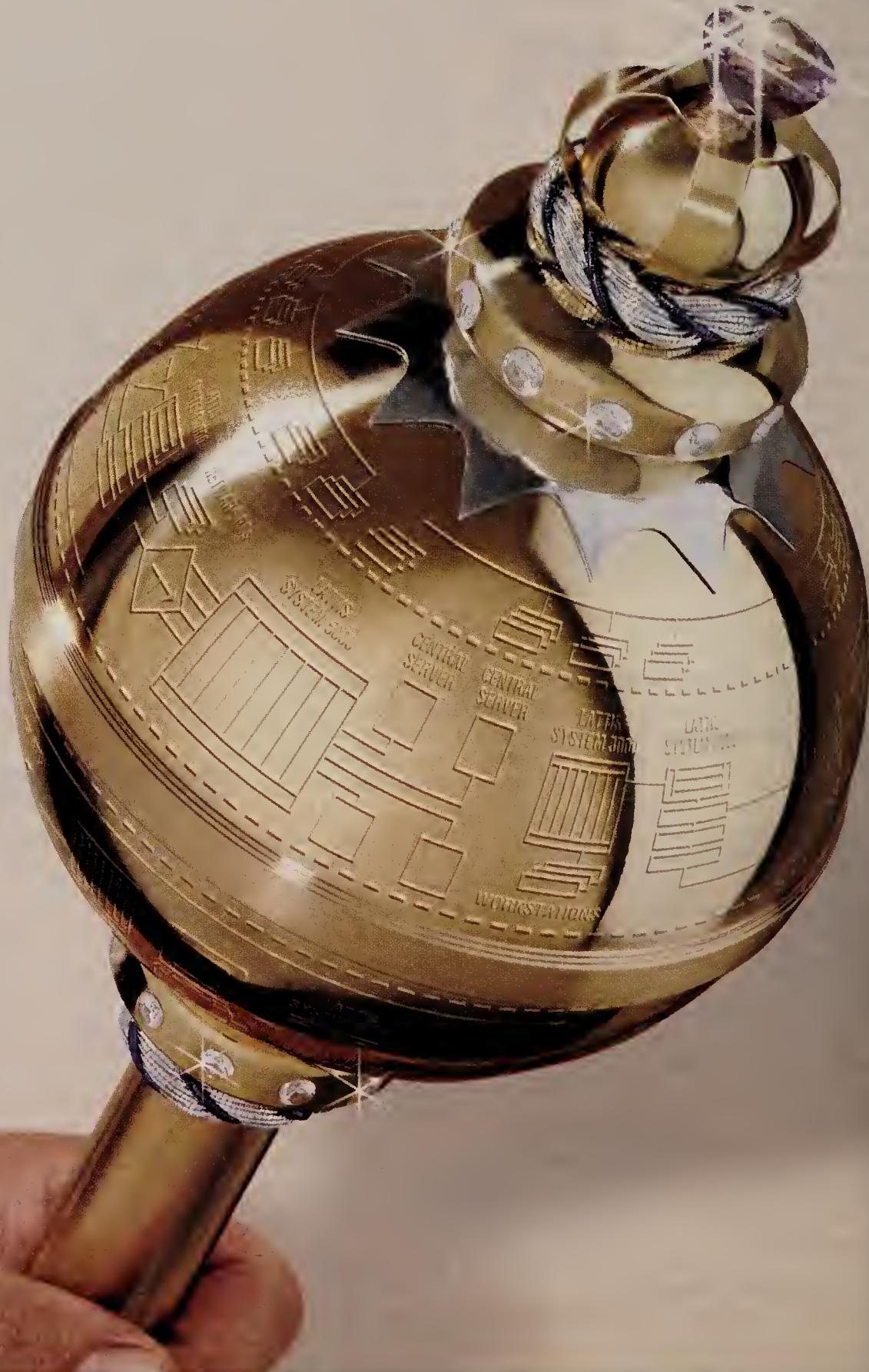
products' respective vendors and the information systems staffer have primary in-house responsibility for each product.

The one gripe that users have with Soft Audit so far is its reporting features. "The reports are too detailed. Either you get all or nothing," said Kevin Dooley, technical services manager at GTE Government Systems in Needham, Mass. Otherwise, he said, he has no complaints; his shop has saved about \$24,000 so far in retired software.

Isogon's Barritz said that additional data-filtering capabilities will be included with the next release of SoftAudit, which is due to ship by year's end. With that version, users will be able to specify products or vendors they wish to be included or excluded from reports, he said.

SoftAudit works with any release of MVS; license fees range from between \$5,000 and \$21,000, depending on the processor size. First-year maintenance is included.

Introducing the Lat A whole new way to



Briefs

Oracle goes vertical

Oracle Corp. signed a \$23 million consulting and software contract with Duke Power Co. The two-year deal is the first major win for Oracle Industries, a program that sells consulting services and prefabricated application templates for specific vertical industries. Duke Power in Charlotte, N.C., plans to create a client/server customer information system using Oracle databases, development tools and connectivity products.

Texas-size contract

The Texas Department of Human Services awarded Unisys Corp. three contracts totaling more than \$25 million for hardware, software and services related to upgrading the state's automated welfare delivery system.

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New Products

Software

4th Dimension Software Ltd. has announced MultiPlatform Control-M to provide automated job scheduling and production-control capabilities for Unix, Digital Equipment Corp.'s VAX/VMS and IBM's AS/400 platforms.

According to the Irvine, Calif., company, MultiPlatform Control-M allows both intraplatform and cross-platform dependencies to be defined, enabling a job or process running on one platform to trigger a different job or process on the same platform or on any other platform supported by MultiPlatform Control-M or Control-M for MVS.

Pricing for MultiPlatform Control-M is based on the maximum number of tasks per day per processor, beginning at \$750

for up to 10 tasks.

► **4th Dimension Software**
(714) 757-4300

Wallace Computer Services, Inc. has introduced electronic forms with Platforms, a group of software products and services that were designed to address larger corporations' needs for global electronic processing solutions.

According to the Hillside, Ill., company, the products offer an open architecture

and include Platforms, electronic forms software modules for constructing corporate applications; the Wallace Electronic Forms Resource Center that consists of services to convert printed forms to electronic forms; enhancements to the Wallace Information Network for additional management and control of corporate electronic forms systems; and installation support.

Prices start at \$90.

► **Wallace Computer Services**
(708) 449-8600

Advanced Solutions International Corp. has added Asist/System Monitor, a real-time system monitoring product, to its line of IBM AS/400-based management tools.

According to the Greenville, N.C., company, Asist/System Monitor provides constantly updated snapshots of 10 critical areas of AS/400 performance. Vital signs such as CPU use and average response times are monitored and continuously displayed on color bar graphs.

Pricing for Asist/System Monitor starts at \$2,000 per CPU.

► **Advanced Solutions International**
(919) 355-8181

Hardware

Xerox Corp.'s Printing Systems Division has announced the Xerox 4220/MRP Console Midrange Systems Printer and the Xerox 4219/MRP and 4215/MRP Desktop Midrange Systems Printers.

According to the Stamford, Conn., company, the printers emulate most IBM printers commonly used in AS/400 settings and accept data streams associated with these IBM printers, including SNA Character Stream, Intelligent Print Data Stream and Document Content Architecture/Final Format Text.

The Xerox 4220/MRP prints up to 20 page/min. at 300 dot/in. resolution and was designed for monthly print volumes of up to 100,000 pages. The Xerox 4219/MRP prints up to 20 page/min., and the 4215/MRP prints up to 15 page/min. Both were designed for monthly print volumes of up to 50,000 single-sided pages.

The Xerox 4220/MRP costs \$12,995; the Xerox 4219/MRP and the Xerox 4215/MRP cost \$5,995 and \$4,795, respectively.

► **Xerox**
(203) 968-3000

Digital Equipment Corp. has introduced Dorio, a single-session text terminal for open systems.

According to the Maynard, Mass., company, Dorio offers 16 modes of terminal emulation and compatibility with more than 30 operating systems.

Key features include industry-standard connectors and protocols, a cartridge slot for firmware enhancements, text windowing through rectangular-area operations, horizontal and vertical scrolling and a Windows-like setup in five languages: English, French, German, Italian and Spanish.

A Dorio terminal costs \$399.

► **Digital Equipment**
(508) 493-5111

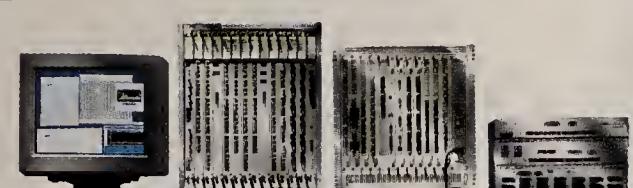
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At the core of the LattisSphere family is the Lattis System 5000, the first network center hub. Combined with Optivity software, the System 5000 provides a central connection and control point from which to manage your entire enterprise. Connect Lattis System 3000™ wiring closet hubs and Lattis System 2000™ workgroup hubs to your network center, and you have the power to build and manage a brand new type of network—the structured network.

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The LattisSphere System brings hardware and software together for a whole new level of network control.

buildings are wired. Take Optivity software, for example. Its intuitive user interface and simple drag-and-drop operation allow you to assign network devices to logical workgroups—regardless of their physical location. So you get the security

of a central location to consolidate and manage key resources, with the flexibility of distributed LAN segments.

The LattisSphere System is modular, too—buy just what you need now,

then integrate new products later. That includes future technologies like ATM and high-speed LAN switching. So as your business grows, you can be assured the LattisSphere System will grow with it. And always be backed by the worldwide leader in intelligent hubs.

To learn more about the LattisSphere System, call 1-800-PRO-NTWK, ext. 41 or return the attached card. And see how total control can finally reign.

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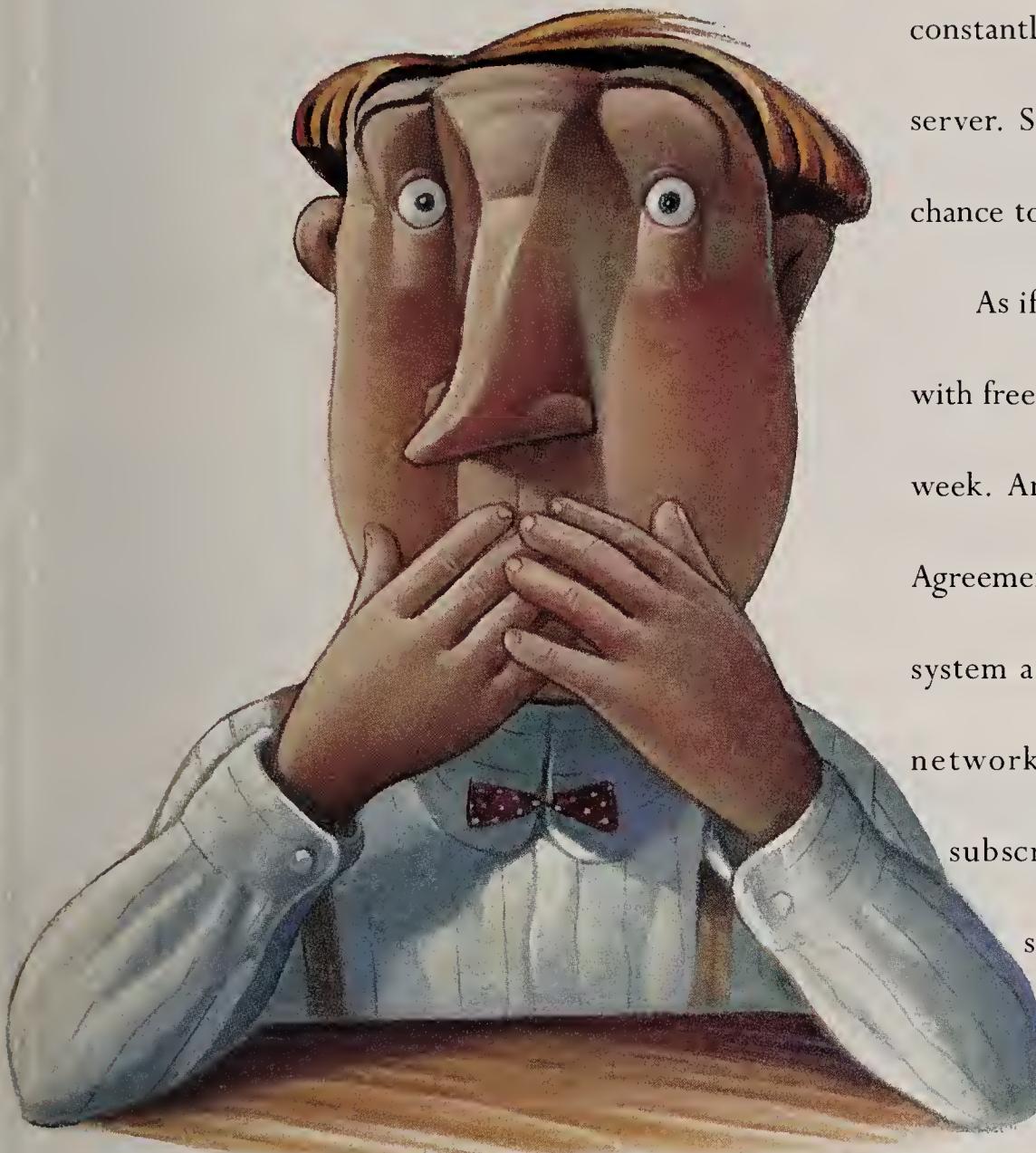
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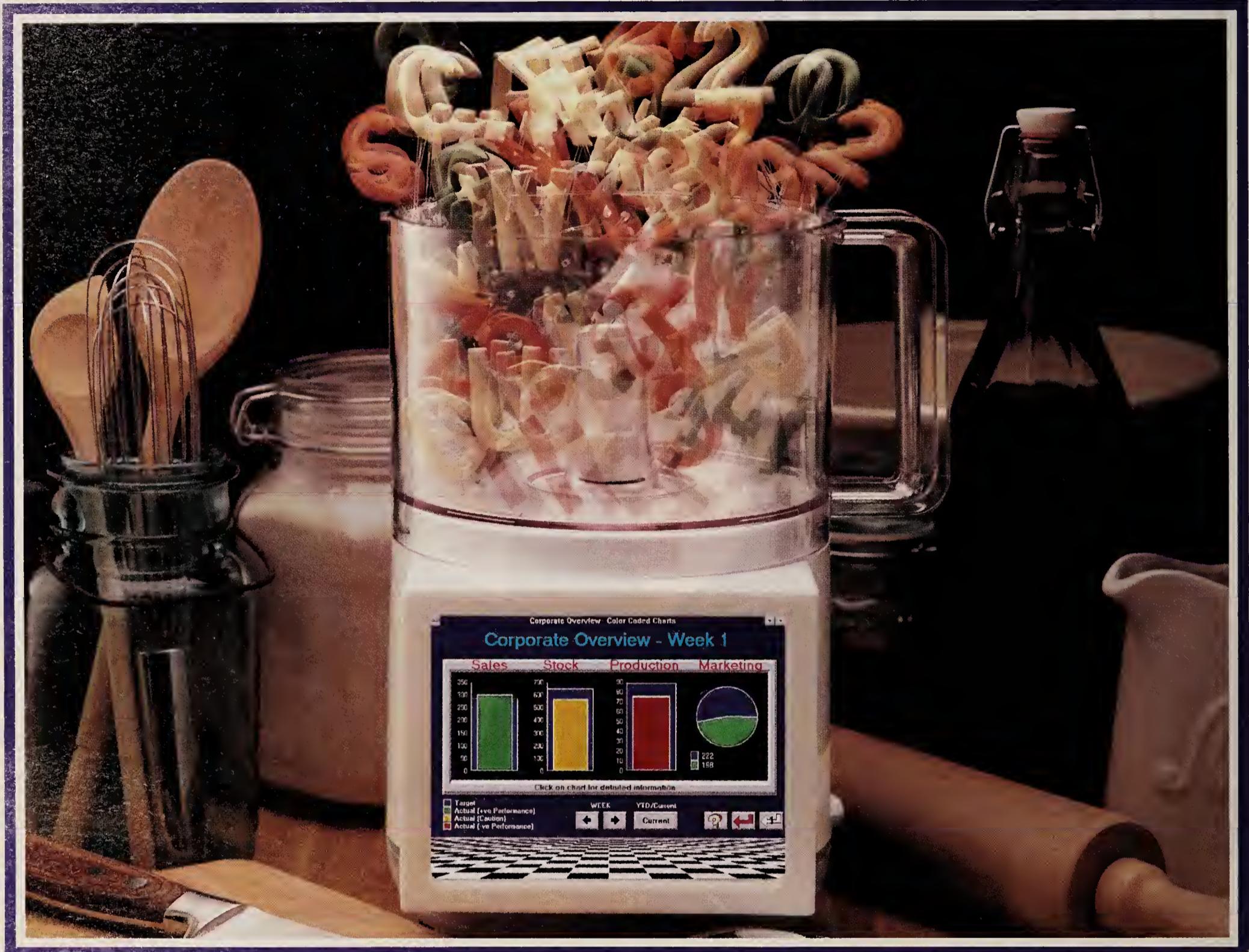
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**Information
Builders**

Borland rolls out C++ 4.0, OWL upgrade

Class library battle with Microsoft wages on

By Melinda-Carol Ballou

For many beleaguered Windows programmers, the subject of choosing a class library to facilitate the development process — Borland International, Inc.'s Object Windows Library (OWL) or Microsoft Corp.'s Microsoft Foundation Classes (MFC), to name the leading contenders — evokes near-religious fervor.

Users of both products said they have saved time with the Windows class libraries, which provide a high-level set of classes for creating Windows applications and offer an application framework.

"Windows classes like OWL and MFC wrap the intricate details [of Windows programming] to let you get up to speed more quickly," said Roger Spitzig, senior systems engineer at The Mutual Life Assurance Company of Canada, an insurance company in Waterloo, Ontario.

The temperature of the Borland vs. Microsoft discussions was raised even

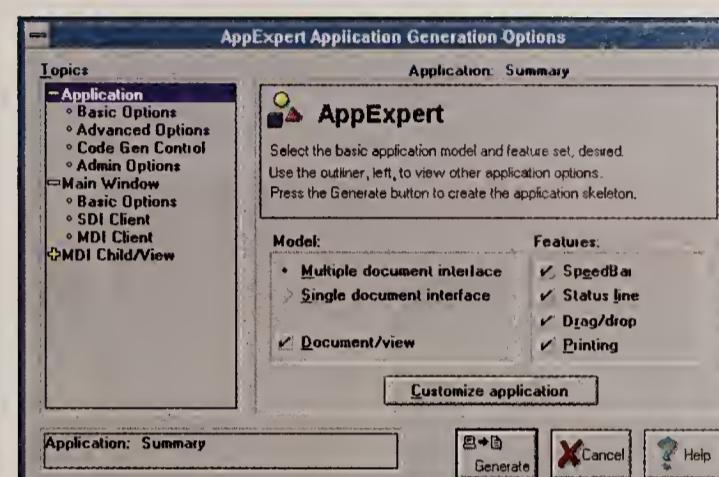
higher by C++ compiler and tools vendors at Comdex/Fall '93 last week, as Borland touted a major upgrade to its C++ products and to OWL and as Microsoft and others previewed upgrades to their products.

Enhanced tools

Officially announced earlier this month, Borland C++ Version 4.0 will offer new visual programming tools for its integrated development environment (IDE), a Brief-based editor, a visual project manager, a new graphical user interface debugger for use within the IDE and an Object Browser with multiple window displays, filters and cross-referencing. It will also feature exception-handling and templates, which give developers a safety net if the application crashes and also make it easier to reuse code.

Major improvements to OWL 2.0 include a set of predefined visual objects, source-code compatibility between 16- and 32-bit Windows, high-level controls

such as floating palettes and tool bars, and broader application programming interface (API) coverage to include the Windows graphics device interface. But these new features also require a transi-



Borland's IDE offers visual programming including point-and-click creation of Windows applications with App Expert as well as an editor and debugger and a design tool for customizing user interfaces

tion for developers who created applications with OWL 1.0 because 1.0 is not compatible with the new class libraries. Borland will supply a utility with C++ 4.0

for making the conversion to OWL 2.0. Users who want to retain their OWL 1.0 applications can compile them with Borland C++ 4.0, according to Borland officials.

Beta users spoke about the advantages of the new version and of class libraries in helping them navigate through the miasma of Windows development.

"In the past, OWL gave you a real leg up in getting an application up and running, but you had to provide most of the functionality using the API," said Frank Imburgio, a project leader at Dean Witter, an investment firm based in New York. "We like the shortcuts with OWL 2.0."

"The [new] Borland tool set reduces the learning curve significantly," he added.

Imburgio said OWL 2.0 is no longer compiler-specific. Previously, Borland used specialized dispatch functions, but it now uses a new C++ template, which opens up the range

Borland, page 72

Vality unveils tool for re-engineering legacy systems data

By Gary H. Anthes

After two years of beta testing, Vality Technology, Inc. has announced general availability of a mainframe-based tool for analyzing, matching, reformatting and scrubbing data extracted from legacy systems.

Called Integrity Programming Environment, the "data re-engineering" product is especially geared for building relational databases for new enterprise systems from old files that contain overlapping, redundant or contradictory information, data errors, inconsistent formats and the like.

Using a neural network-like approach, Integrity employs user-specified scoring criteria for matching records or data fields. It is far more flexible and accurate than conventional data-scrubbing products — such as the merge/purge systems used by service bureaus to prepare mailing lists — that rely on hard-coded if-then rules, Vality said. It is especially adept at processing files containing names and addresses (see chart).

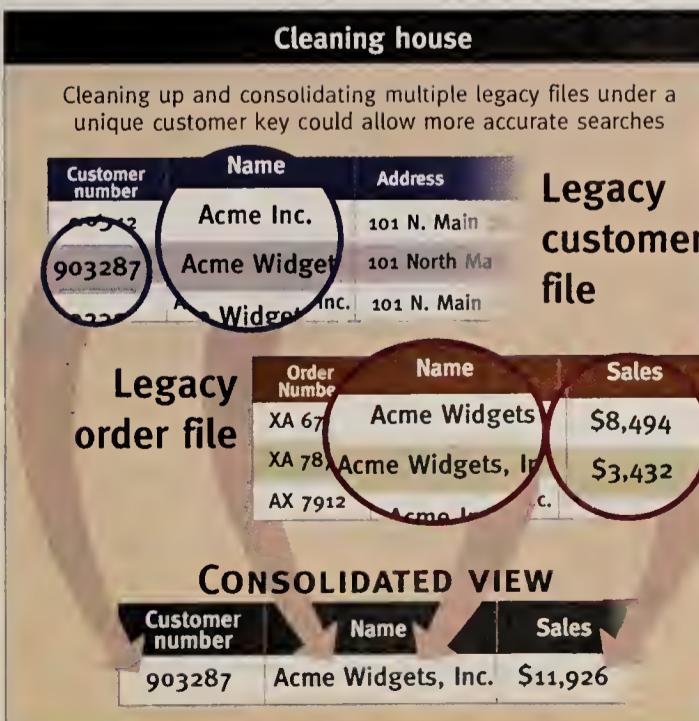
Through statistical analyses,

Integrity can zero in on key data elements floating in free-form text, such as name and address fields. It can also uncover unknown patterns or errors, such as foreign addresses in records intended for domestic mailings, said Steven Feldman, marketing communications director at Boston-based Vality.

"Companies are starting to recognize that data re-engineering is on the critical path for business process re-engineering," Feldman said. "You can't re-engineer the future without cleaning up data problems of the past."

People often "drastically underestimate" the difficulty of migrating legacy data to relational

Vality, page 72



IBM offers entry-level C++ development kit

By Johanna Ambrosio

IBM announced enhancements to its C++ development kit and at the same time unveiled an entry-level version called FirstStep.

The full-fledged kit, called C Set ++, runs under OS/2 2.1 and allows developers to build object-oriented applications. As such, C Set includes object libraries and an optimized compiler.

With the additions in the new version, C Set also now includes support for drag/drop objects in enhanced class libraries, an interface builder called Kase:Set developed by Kaseworks, Inc. and an improved version of an integration mechanism called WorkFrame/2 that allows developers to use third-party tools with C Set.

Object drag feature

Wayne Kovsky, a consultant in Monument, Colo., who runs OS/2 developers' conferences, has been using Version 2.0 of the tool kit but has tried some of the new user class libraries in beta form. These allow developers to drag one object to another, thereby invoking

an action to take place. For example, the spreadsheet icon could be dragged over to the printer icon to invoke the spreadsheet and format it properly for the printer.

"You could always do drag/drop," Kovsky said, "but this should make it a lot easier."

C Set 2.1 is available now in retail and other outlets or through IBM directly, priced starting at \$395 for a CD-ROM version. Documentation is not included.

FirstStep, for its part, is a slightly pared-down version of C Set. For one thing, FirstStep's compiler, although the same as that in C Set, is not optimized.

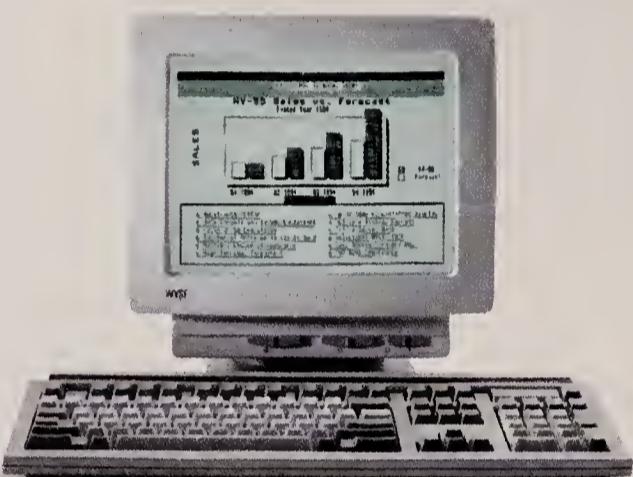
Also, FirstStep contains a slightly older version of Workframe/2, a third-party integration mechanism.

Finally, FirstStep lacks the user interface library contained in C Set, although both products contain the collection class and standard libraries.

The CD-ROM version of FirstStep is available directly from IBM for \$85. Packages including floppy disks and/or documentation are priced slightly higher.

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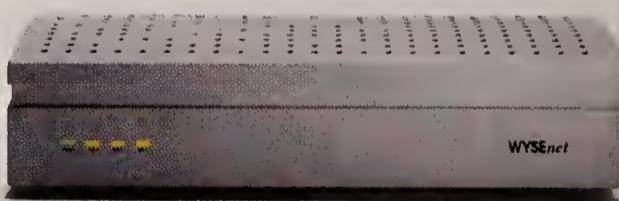
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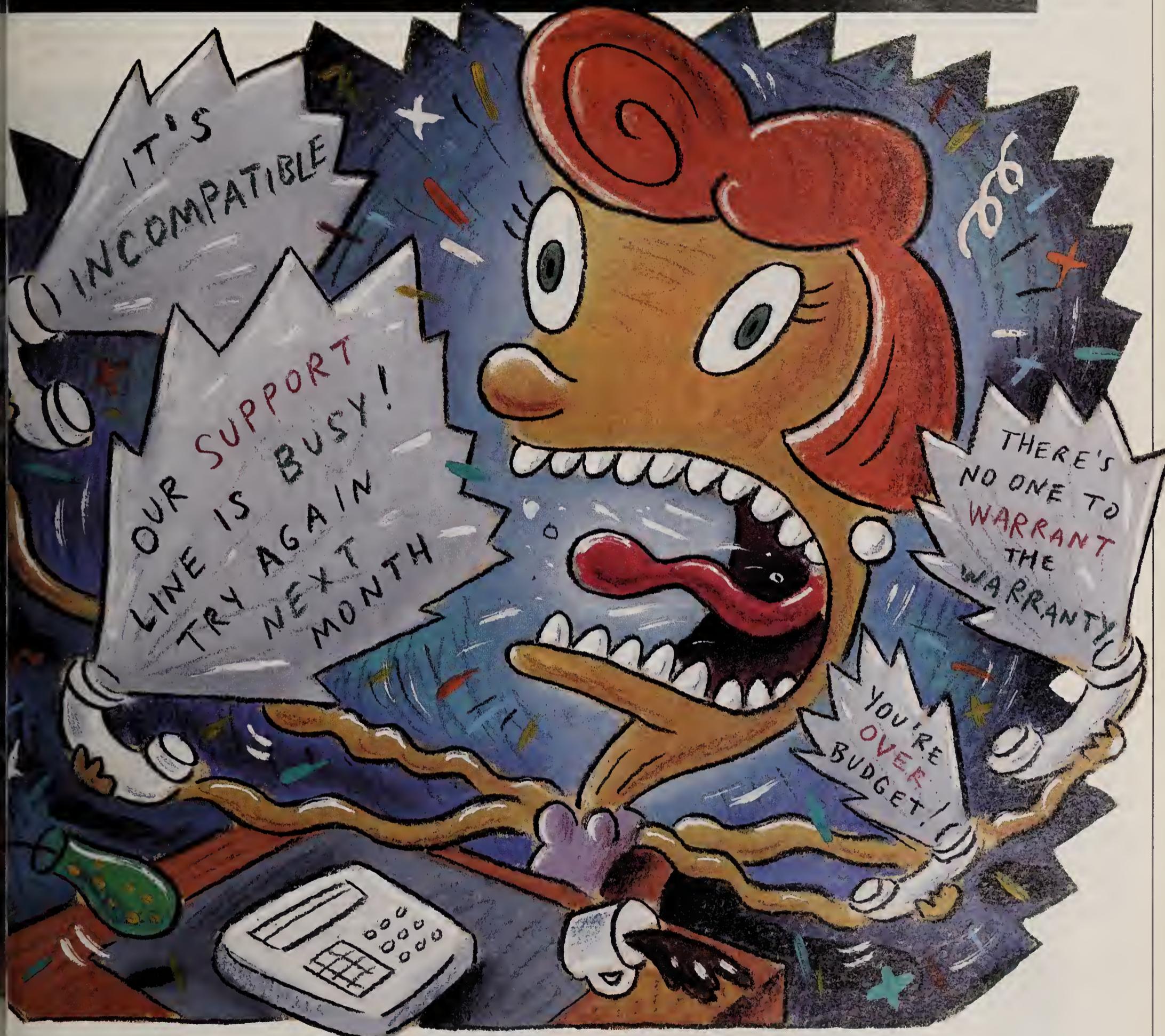
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WYSE

Borland C++ 4.0

CONTINUED FROM PAGE 69

of compilers on which OWL applications will be able to run.

Microsoft, on the other hand, will release an upgrade to its Visual C++ compiler and environment next month, along with MFC 2.5, both of which incorporate Microsoft's Object Linking and Embedding (OLE) 2.0 and Open Database Connectivity support, among other features.

Borland will offer OWL classes for OLE 2.0 next year, and developers can now create OLE 2.0-compliant applications with the Borland tools, officials said.

Weigh the options

While Microsoft's MFC offers tight mapping to Windows APIs, Borland's OWL offers greater portability, according to Michael Schneider, an analyst at Gartner Group, Inc., a market research firm in Stamford, Conn.

"If you have people who want to live with Windows for the rest of their lives,

then MFC will solve their problems. But I think we're looking at a lot of volatility in the operating system world over the next two or three years, which makes a strong case for going with Borland's OWL," Schneider said.

While Borland and Microsoft fight it out, Symantec Corp. is moving back in the race. Over the summer it released its upgraded C++ compiler and tools, which use MFC for class libraries [CW, Aug. 23].

But Symantec has "a lot of work to do to

get out there and take market share from Borland and Microsoft," said Brent Williams, an analyst at International Data Corp. in Mountain View, Calif.

Borland also announced Borland Visual Solutions Pack, a set of 25 VBX controls, and Borland Jumbo Assembler, which offers 16- and 32-bit assembler for C/C++, Pascal, Cobol, Basic or Fortran applications.

Borland C++ 4.0, including 16-bit DOS and 16- and 32-bit Windows support, as well as ObjectWindows 2.0, is priced at \$495 and will ship by the end of this month. Borland's 16- and 32-bit Turbo Assembler 4.0 will ship separately and is priced at \$99.

Vality unveils tool

CONTINUED FROM PAGE 69

databases, he said.

First Data Corp. in Boston uses Integrity to re-engineer mutual-fund investor data from two old legacy systems for a new relational database supporting decision-support applications. "We have a lot of information buried in those legacy

structures that we can't get at," said Augie MacCarrach, senior data analyst at the shareholders services group.

MacCarrach said most conventional approaches to cleaning up and reformatting old records deal only with problems anticipated in the logic of the conversion programs. "But Integrity finds and handles things that are not visible to you. It lets you identify those maybe 10 exceptions out of 1 million records. With Integrity, you assume nothing and you discov-

er the true nature of your data."

"Vality's data cleaning offers corporations a way to intelligently streamline overgrown, inconsistent legacy data stores," consultancy Meta Group, Inc. said in a written report. "Vality offers companies the facility to clean legacy data first, extract its value and then apply information warehousing or business process re-engineering."

Integrity is used at some 20 sites, Vality said, and costs from \$95,000 to \$200,000.

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New Products

NeuroDynamx, Inc. has introduced DynaMind Developer Pro, a suite of neural network software tools designed for PC, Macintosh and workstation platforms.

According to the Boulder, Colo., company, the product includes a scripting language for neural network training and testing, a comprehensive set of link-

able C routines, DynaMind simulation software and neural chip emulation.

The PC version of DynaMind Developer Pro requires an IBM-compatible computer with 80286 or higher, Windows 3.1 or MS-DOS 3.1 or higher, 2M bytes of memory and one 1.44M-byte, 3½-in. disk drive and hard drive. It costs \$1,795.

The Macintosh version of the product costs \$1,795 and requires Macintosh II or higher with math coprocessor, Macintosh System Software Version 6.0 or

higher and 2M bytes of memory.

The Workstation version is priced at \$3,995 and operates with Unix workstations, including those from Sun Microsystems, Inc., Digital Equipment Corp. and Hewlett-Packard Co.

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NobleNet, Inc. has announced a Win-Sock-compliant version of its WinRPC compiler.

According to the Southboro, Mass., company, the compiler enables Windows programmers to automatically generate communication source code that is binary-compatible with WinSock-compliant protocols.

Through remote procedure call (RPC), the computer-generated code distributes applications across Windows, DOS, Unix and Novell, Inc.'s NetWare platforms. Because WinSock is an open interface for network programming under Windows, a common TCP/IP application programming interface is provided to which network software vendors and application developers can conform.

WinRPC 2.0 developer's kits cost \$995.
► **NobleNet**
(508) 460-8222

Kenan Technologies has introduced Version 1.0 of the Acumate Enterprise Solution.

According to the Cambridge, Mass., company, the product is built around Multiway, a field-tested multidimensional database and fourth-generation language.

The Acumate Enterprise Solution offers client/server capabilities, object-oriented programming and instructional on-screen "co-pilots" to facilitate data configuration.

Other features include a focal point integrator, a programming object that pinpoints data sources and manages the data loading and integration process, and an open application programming interface that supports multiple users over multiple network protocols.

Acumate Enterprise Solution pricing begins at \$25,000 for a minimum five-user client/server configuration.

► **Kenan Technologies**
(617) 225-2224

Product short

Gimpel Software has announced PC-lint for C/C++, a lint tool designed to support C++. The product can analyze a mixed suite of C and C++ programs and report on glitches, bugs and inconsistencies. Cost: \$239. Gimpel, Collegeville, Pa. (215) 584-4261.

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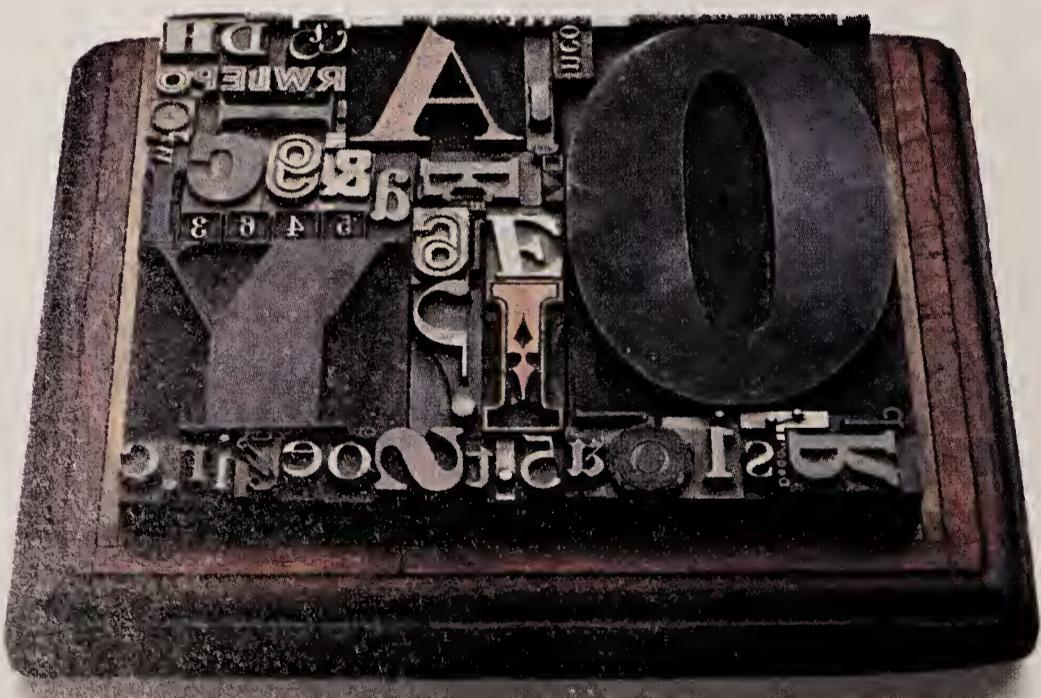
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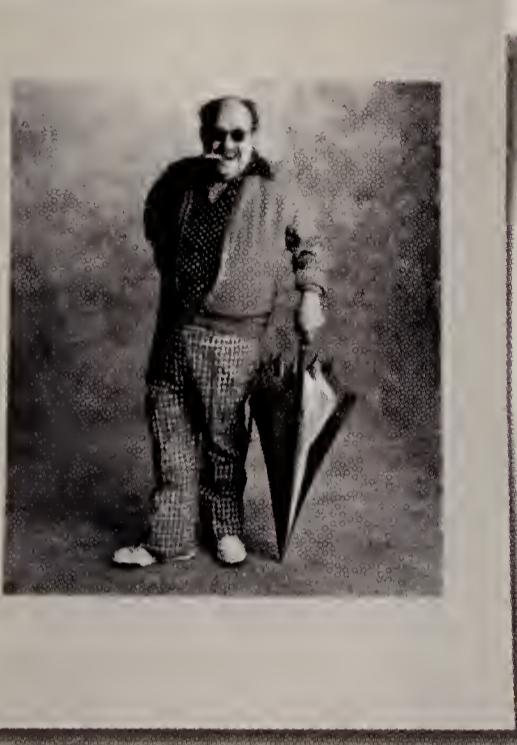
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telephone pitches about gold mines in Bo-
livia to randomly chosen targets.

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ing it easier to find and exploit low-income,
elderly, naive or other vulnerable people.

Lawmakers can't keep up. Consumer
watchdog groups can't track all of these
campaigns, many of which are perpetrated
far from the target audience. The Direct
Marketing Association (DMA) in New York
keeps repeating that the industry should
police itself.

This is an issue that information systems
professionals will have to grapple with, both
as guardians of corporate data that could be
misused and as builders of systems that can
be used for nefarious ends.

Arming these scam artists are so-called
"sucker" databases that contain the mailing

Sucker, page 79

BY ALICE
LaPLANTE



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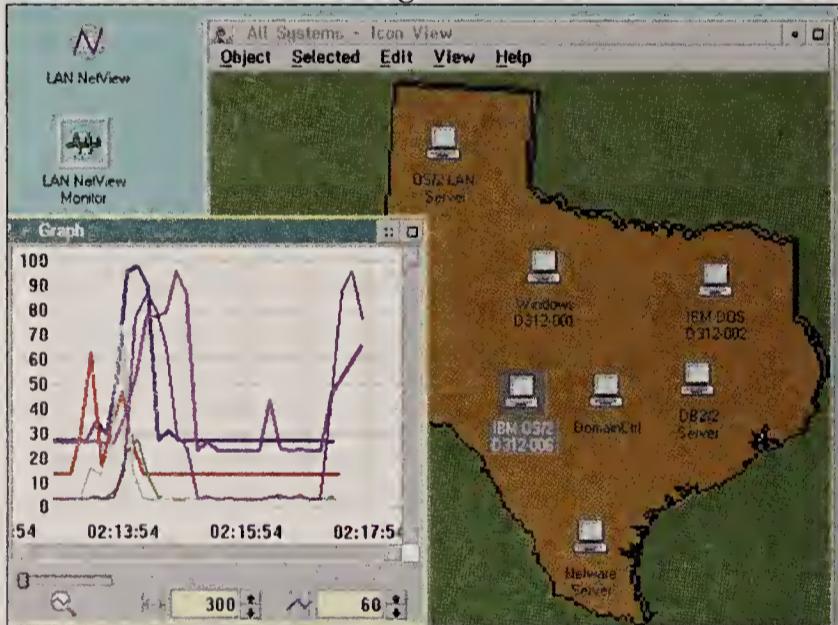
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Management

Sucker

CONTINUED FROM PAGE 77

addresses and/or phone numbers of likely marks. The numbers of these databases are increasing, and they're becoming easier to access.

Of course, they're not called sucker databases. They're listed in *Direct Mail List Rates and Data*, the bible of direct marketing organizations, as "Opportunity Seekers," "Sweep-Nos" or "Game Buyers, Contest and Puzzle Participants."

These databases are not the standard marketing databases that profile income, lifestyle and consumer habits. They are the databases that peg you as easy prey.

Getting your name into this kind of database isn't difficult. Anyone who responds to a pre-approved credit card offer with an outrageous processing fee can pretty much count on landing in the circulating electronic files of the credit-poor and financially desperate. Even sending in a sweepstakes offer that comes in your mail can be a ticket for admission.

Good intentions

The fault does not always lie with the businesses collecting the information. Data that marks individuals for this kind of exploitation may be offered commercially with innocent intentions but may be misused by the renter. In extreme cases, it may even be stolen.

But both compilers of databases and renters have found themselves under investigation for their practices, as illustrated by the following cases:

• In June 1991, a direct mail campaign initiated by evangelist Oral Roberts apparently targeted consumers with heavy financial obligations, asking for charitable donations to aid in the "war against debt." In the personalized appeals, Roberts repeatedly alluded to the fact that the letter recipient was financially overwhelmed and asked for \$100 in exchange for prayers to be said on behalf of the consumer and "the war against debt."

• In July 1992, a federal grand jury indicted the owner of ListWorld, Inc. in Huntsville, Ala., and nine other defendants on more than 140 counts of fraud. The defendants were alleged to have contacted by telephone and mail consumers from a database of individuals with poor credit histories, offering them low-interest credit cards. Respondents were charged up to \$200 in "processing fees," then merely sent lists of

BEWARE

Perhaps the best way for companies to safeguard against potential abuse of databases is to notify their customers that information about them is going into a database that could be shared.

Steve Rees, a magazine management consultant and president of San Francisco-based Publishing 20/20, gives publications that rent their subscriber lists this advice:

■ Tell subscribers up front – and often – that the personal data they provide will be used for other purposes.

■ Offer them the opportunity to exclude their name from list rentals.

■ Always ask the marketing firms renting your list for a sample of what they are mailing.

■ Seed your list with random "dummy" names so you can check if they are being honest with you.

banks that offered such cards — information readily available from public sources.

• In September 1993, an administrative law judge tried to prohibit Chicago-based Trans Union Corp. from compiling and selling targeted marketing lists based on the credit habits of consumers unless the list buyer intended to make a "firm offer of credit to each consumer on the list." Trans Union is appealing the injunction and continues to sell various subsets of the consumer databases in question.

• The Florida Insurance Commissioner's Office is currently investigating alleged misrepresentations by salespeople in Metropolitan Life Insurance Co.'s Tampa office, who are said to have used direct mail and telephone solicitations to push life insurance policies under the guise of high-interest-yielding retirement accounts. The particular MetLife promotion under investigation was targeted specifically at nursing professionals nationwide. An internal audit is also underway.

Opportunity knocks

The most common reason for a company to rent database lists is to identify potential customers and filter out unlikely ones. After all, the last thing a legitimate company wants is to make an offer to a person who is either unable or unwilling to pay.

But what about the unscrupulous marketer, the one searching for credulous or financially desperate targets? It is precisely the people who are filtered out from legitimate offers who are of interest to these marketers. These people are seen as more likely to enter into desperate gambles. And there's one born every minute — or at least the marketers are banking on that premise.

"An opportunity seeker is merely a euphemism for sucker," says Mary J. Culnan, an associate professor at the School of Business at Georgetown University in Washington. Culnan always asks herself upon seeing these lists advertised, "What are your customers selling that normal people won't go for?"

Culnan keeps a file of databases that worry her because of "the inferences you can make about the people on these lists."

In addition to the so-called opportunity seekers, another category of direct marketing databases — "Sweep Nos" — incorporates people who enter contests or sweepstakes without

purchasing any products or services.

Highly lucrative databases, Sweep Nos are perceived as especially rich fodder for direct marketers because people who respond to offers such as sweepstakes are considered "mail responsive," says Ernest H. Schell, president of Marketing Systems Analysis, Inc. in South Hampton, Pa., a systems analysis and integration firm that puts together computer systems for direct marketing firms.

"These are not people who consider direct mail 'junk' and throw it away," Schell says. "They take the trouble to become involved even when they're not interested in the product being offered."

Potential for misuse

There are certainly legitimate reasons for organizations to buy databases, such as to target a marketing campaign only to those likely to

need or want their service or product or to eliminate applicants who may be credit risks.

Examples include the "Credit Alert File" and the "Access America Credit," which, respectively, list people who are at least 60 days past due on their credit cards and seekers of credit cards whose applications were denied within the last 30 days.

Most list owners, however, are quite conscientious about how their databases are being used, according to Bill Dodd, director of Dodd Smith Dann, a San Francisco direct response firm. Dodd was formerly the circulation director at *Mother Jones* magazine and was responsible for renting out its subscriber list to interested marketers.

"Generally, you know the people renting the lists. They come through an established broker or firm that you trust," he says.

Moreover, Dodd says, "The direct mail industry is a small industry, and word spreads when someone is misusing a list. The industry cuts them off."

But for every 100 companies that use such marketing lists legitimately, there is perhaps one company that doesn't, says Jim Minno, an independent marketing consultant in Rochester, N.Y. List brokers — who sell but may not create these massive consumer databases — are not terribly diligent about checking up on their customers, he says.

Sucker, page 81

LISTS YOU

PROBABLY

DON'T

TO BE ON

The following lists from *Direct Mail List Rates and Data* probably offer value to certain legitimate direct marketers. But Denison Hatch, editor and publisher of "Who's Mailing What" and editor of "Target Marketing," and Mary J. Culnan, an associate professor at the School of Business at Georgetown University, warn that these lists are prime fodder for the exploitation of vulnerable "targets" concerned about their finances, health, mental well-being, aging or other issues.

America Seeking Opportunity: Individuals who took part in or inquired about multilevel marketing, money-making schemes, starting their own business, get-rich-quick and self-promotion programs.

Hot Line Bankcard Applicants: Individuals who have been turned down for credit by major banks.

Precision Optical Buyers: Over-40-year-old mail-order buyers of magnifying reading glasses, handheld magnifiers, glasses cases, sunglasses, etc.

Call & Claim 900 # Respondents: Respondents to a postcard promotion that says to call a 900 number for instant identification of a "preselected guaranteed" prize.

Penthouse Publications 900 # Callers: Male 900 number callers to various Penthouse publications and services.

Active Senior Citizens Working to Preserve Social Security and Medicare: Senior citizen donors to, and supporters of, preservation of the Social Security and Medicare systems.

Diabetes Self-management: Subscribers to a publication of health and lifestyle information for consumers who have diabetes or diabetic family members.

CreditMaster Applicants: Respondents to a national sales program for securing credit cards for people with poor or no previous credit history.

Source: *Direct Mail List Rates and Data*, November 1991, Standard Rate and Data Service, Wilmette, Ill.

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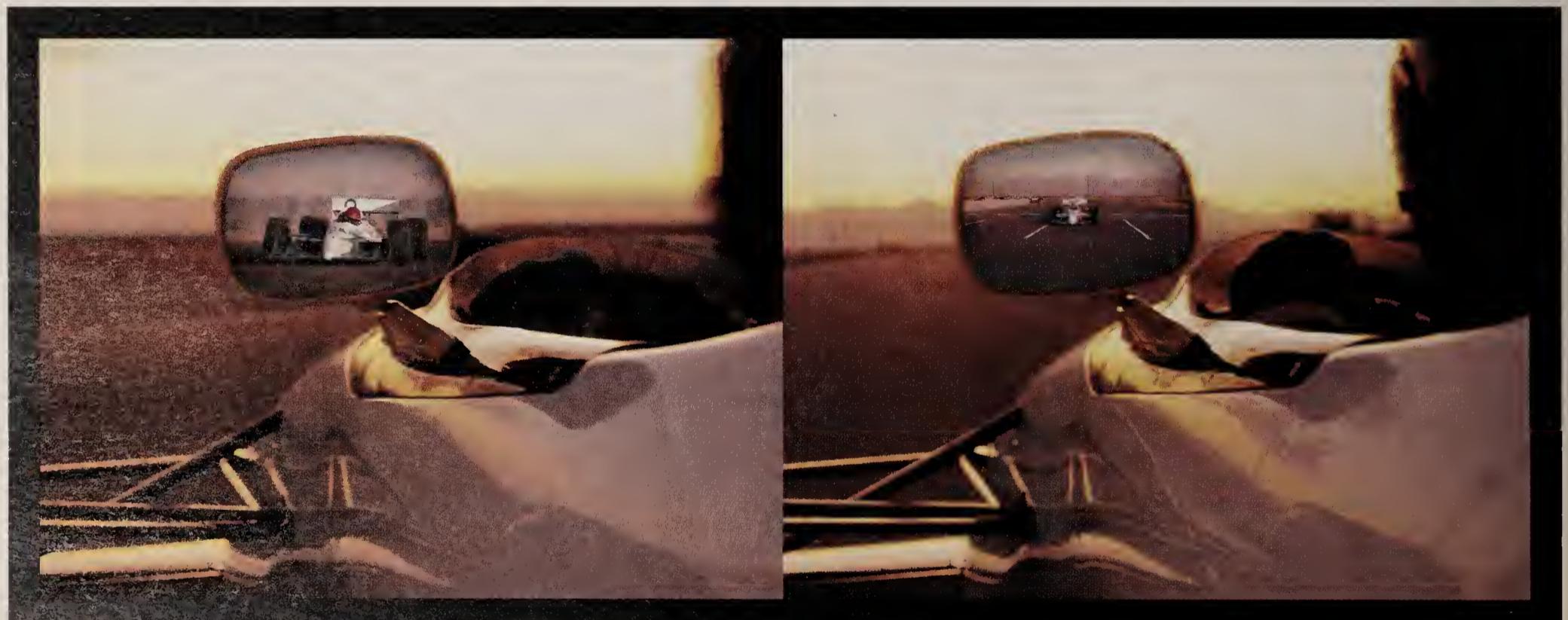
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Sucker

CONTINUED FROM PAGE 79

Also worrying Culnan is the growing practice of companies downloading proprietary information from mainframe files into relational databases so outside users can get to it.

"If a company creates a data warehouse environment precisely so that users can go in and do ad hoc reporting against a relational database, how would you know what's been extracted or what it's being used for?" asks Ivan Brass, vice president of systems and technology at Paramount Publishing in Old Tappan, N.J., a division of Paramount Communications.

Denison Hatch, an active member of the DMA, is concerned that improper use of such databases will throw a shadow on legitimate marketing campaigns and the direct marketing

If a company creates a data warehouse environment precisely so that users can . . . do ad hoc reporting against a relational database, how would you know what's been extracted or what it's being used for?"

Ivan Brass, vice president of systems and technology at Paramount Publishing

industry in general. Hatch is also editor and publisher of the "Who's Mailing What" newsletter and editor of the "Target Marketing" newsletter in Philadelphia.

The problem is the lack of control over who gets access to these databases and for what purposes, Hatch says.

The ethics debate

So what are the ethics of seeking out vulnerable targets? What about purchasing a database of U.S. residents with diabetes or heart ailments or people who have sought remedies for managing stress, panic or anxiety attacks?

Beverly Goodwin, head of the ethics committee for the American Prospect Research Association, says the ethical issues new technologies raise is of growing concern to association members.

The association comprises people who spend their professional lives seeking individuals likely to give money to nonprofit and charitable organizations. Their prime worry: what constitutes exploitation of these "prospects" — who are, after all, sought precisely because they are seen as likely to have excess cash.

For example, say you are the fund-raiser for a medical facility, Goodwin says. Often, when a family member has died of a particular disease — bone cancer, for example — the family will ask friends, relatives and the community to send donations to the hospital or related medical research foundation in lieu of flowers or sympathy cards.

The potential for fund-raisers to use new database technologies to solicit such bereaved families for donations is perhaps the most extreme case that worries Goodwin. She says it would be in poor taste at best and unethical at worst.

As an example, Culnan points to a well-publicized mailing that was sent to senior citizens in the Washington area during the summer. Political action committees lobbying for Social Security and Medicare increases targeted the elderly, sending strong letters that in effect "scared" many of them into donating funds for these efforts, Culnan says.

"Often, the elderly are more vulnerable both emotionally and financially," she says. "Is it right to target them?"

Some laws already exist to protect populations perceived as especially vulnerable. Selling job listings was made illegal in most states decades ago, according to Jack Dale, vice president of sales and newspaper relations at North American ClassiFacts in Denver.

"There were a large number of frauds being perpetrated where people would pay exorbitant amounts for supposedly exclusive job listings that were often just photocopied out of the newspaper," Dale says.

Passed muster

ClassiFacts provides a computerized search service to job seekers. It will scan its database of 51 member newspapers for classified ad keywords in a given job category, salary range or geographic region. Up and running as of Oct. 3, ClassiFacts had a slower-than-expected start-up period because of the question of possible exploitation. Dale says the company has had to be care-

ful to note it is merely an extension of the classified sections of those 51 newspapers, not a job placement clearinghouse.

"We needed to contact the attorney generals of all 50 states to make sure what we were doing was not only legal but proper," Dale says.

Questionable uses of demographic ZIP code databases can be subtle. For example, it's perilously easy to locate low-income areas through databases that list personal demographics by ZIP code and target mailings accordingly.

"The poor always pay more," says Lance Haver, executive director of the Consumers' Education and Protective Association in Philadelphia. "Now they're easier to find."

"Rent-to-own and second mortgage scams have traditionally targeted low-income people," agrees John Baker, senior vice president at Equifax, Inc., a consumer credit reporting agency in Atlanta. Baker also sits on the Federal Reserve Board's consumer advisory committee and says such scams as rent-to-own and second mortgage ultimately cause victims to pay from two to 10 times as much as they would under normal circumstances.

But "technology shouldn't be the fall guy," Baker argues. "The real problem is a lack of a standard as to how personal data can be used."

True, high-tech tools don't create criminals, Haver says. "But they certainly enable more efficient targeting and bilking of potential victims," he says.

LaPlante is a free-lance writer in Palo Alto, Calif.

IS professionals asked to take leadership role in the ethics debate

MANY BELIEVE

that it's high time for information systems professionals to involve themselves in the process of monitoring what consumer databases are used for and by whom. Ernest Kallman is one of them.

A professor of computer information systems at Bentley College in Waltham, Mass., Kallman has been researching the issue of ethics for IS professionals in conjunction with the Center for Business Ethics, also located at Bentley. Chief information officers must take leadership roles in ethics considerations, according to Kallman.

"We always consider the economic, operational or technical feasibility of an IS project, but nobody ever sits back and asks, 'Is this ethically feasible?'" Kallman says.

The legality of a request from a user, manager or department for IS to aid in collecting, processing or querying a database is no justification in many cases, Kallman says. "We need to consider whether it is ethical."

Kallman's problem with IS and ethics: It's not enough to just follow orders from above if those orders are unethical. To illustrate the point, he uses an analogy from Nazi Germany.

"What if the Nazis had the potential to electronically pinpoint Jewish citizens by searching through a massive database? It's not that they couldn't do that successfully using manual methods — they obviously did — but computer technology would have made the effort easier. It's the ethical responsibility of a technologist to refuse to help in such cases and to recognize that the potential for harm can be greatly magnified by technology," Kallman says.

Robert M. Rubin, vice president of information services at Elf Atochem North America, Inc. in Philadelphia, agrees. "The ethics of the IS profession are no different than those of anyone else engaged in business," he says.

Rubin is also the president of the Society for Information Management, the 2,700-member professional organization for senior IS executives. "We are obligated to make sure our organizations are performing in an ethical manner," he says.

Indeed, Rubin has "a simple sniff test." He suggests, "If you would be embarrassed to go home and tell your spouse, significant other, children or parents what you are doing, don't do it."

Not quite that simple

Although agreeing with Rubin and Kallman in spirit, other IS managers point out the practical difficulties of taking this "high road" — especially in tough economic times when senior-level technology jobs are scarce.

"Absolutely, if something illegal is going on, it's your duty to take action," says Ivan Brass, vice president of systems and technology at Paramount Publishing, a division of Paramount Communications. "It's no different from copying software. It's against the law. Blow the whistle."

For those "gray areas," however — where perhaps there's possible exploitation but no broken laws — Brass says it's harder for IS managers to act decisively.

"We are the providers and processors of information. We can't be censors," he says. If something appears out of line, an IS professional should bring it to the attention of higher management and let them take appropriate action.

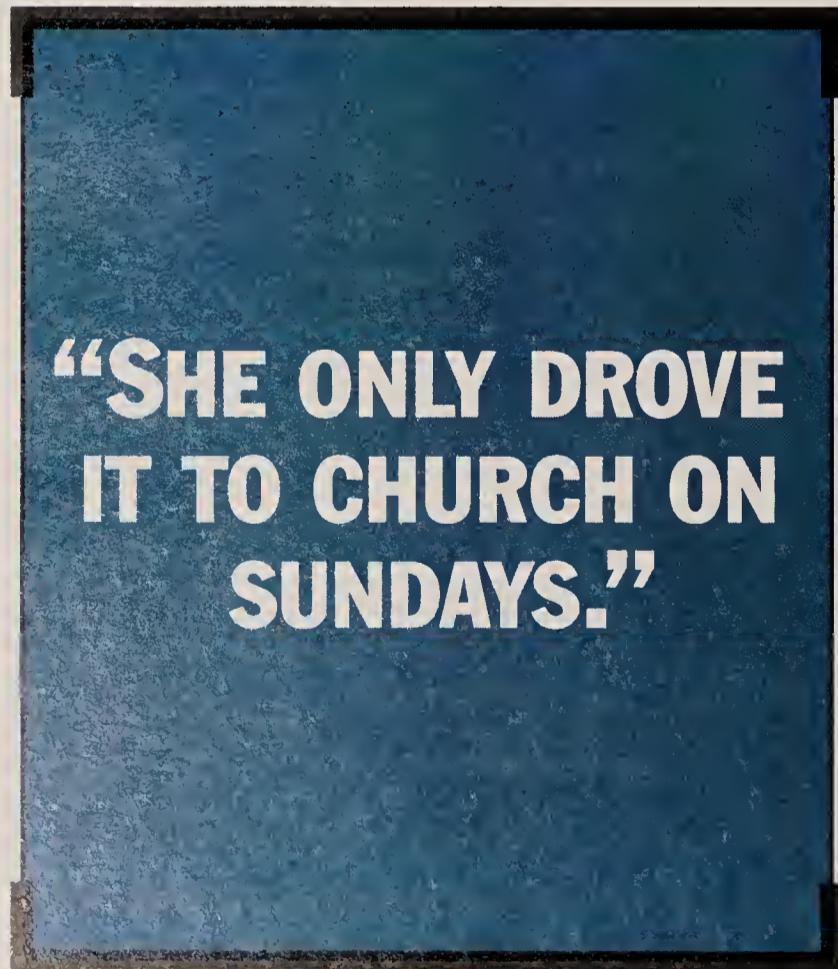
"But if senior management knows and approves, and it's not illegal but merely borders on something that is not nice, I don't know that you can do a hell of a lot," Brass says.

But CIOs must take responsibility for such issues, says Mary J. Culnan, an associate professor at the School of Business at Georgetown University.

"They need to be concerned about larger issues that affect the corporate entity. They need to ask, 'Would I like it if our company ended up on the front page of the *New York Times* for doing this?'" Culnan says. "If the answer is 'no,' they need to take appropriate action."

—Alice LaPlante

Calendar



DEC. 5-DEC. 11

Database Marketing Conference & Exposition. Orlando, Fla., Dec. 5-7 — Contact: The National Center for Database Marketing, New York, N.Y. (212) 972-2410.

Lotus Notes Users Conference. Lake Buena Vista, Fla., Dec. 5-9 — Contact: Lotusphere '93, Sudbury, Mass. (508) 443-1457.

Computer Measurement Group: Managing the Wave of Technology. San Diego, Dec. 5-10 — Contact: Computer Measurement Group '93, Chicago, Ill. (708) 655-1812.

Wireless Datacomm '93. Washington, Dec. 6-8 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Internet World '93 & Document Delivery World '93. New York, Dec. 6-9 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

First International Newton Industry Platform Development Conference. Santa Clara, Calif., Dec. 7-8 — Contact: Knowledge Industry Publication, White Plains, N.Y. (914) 328-9157.

Cause '93. San Diego, Dec. 7-10 — Contact: Cause, Boulder, Colo. (303) 449-4430.

Internetwork Management Technology Conference. New York, Dec. 8 — Contact: Beaupre & Co., Portsmouth, N.H. (603) 436-6690.

ITRC Innovation Through IT Research Opportunities. Etobicoke, Toronto, Dec. 8 — Contact: Anne Tyrie, Information Technology Research Center, University of Toronto (416) 978-7205.

The Outsourcing Conference: Opportunities, Strategies, Realities. Boston, Dec. 8-9 — Keynote speakers and programs will include Dale Kutnick, president and research director, Meta Group, Inc., "Making the Outsourcing Decision"; Capers Jones, founder and chairman, Software Productivity Research, Inc., "International Outsourcing: A Challenge to the U.S. Software Industry"; and Rota Terdiman, program director, Gartner Group, Inc., "Outsourcing: The Latest Update." Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

"Outsourcing the IS Function." San Francisco, Dec. 8-9 — Contact: International Quality & Productivity Center, Upper Montclair, N.J. (201) 783-4403.

Database World. Chicago, Dec. 8-10 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3880.

Strengthening the IS/Client Relationship. Minneapolis, Dec. 9-10 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

The Kerzner Approach to Project Management: A Systems Approach to Planning, Scheduling and Controlling. Dallas, Dec. 11-12 — Keynote speaker will be Harold Kerzner. Contact: Lori Milhaven, International Institute for Learning, Inc., New York, N.Y. (800) 325-1533.

DEC. 12-DEC. 18

"Electronic Government: Policies for Redesigning Government and the Workplace and for Improving Communications with Citizens." Washington, Dec. 12-14 — Sponsored by the State Information Policy Consortium. Contact: National Association of State Information Resources Executives, Lexington, Ky. (606) 231-1905.

Lap and Palmtop Exposition and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

Re-engineering: The Implementation Perspective. Boston, Dec. 14-16 — An educational seminar providing an introduction to the concepts and objectives of re-engineering with an analysis of the business factors driving it. Instructor will be Michael Hammer, The Center for Re-engineering Leadership in Cambridge, Mass. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

JAN. 2-JAN. 9, 1994

Third Annual ShowBiz Expo. New York, Jan. 6-8 — Contact: ShowBiz Expo, Los Angeles, Calif. (213) 668-1811.

JAN. 9-JAN. 15, 1994

ObjectWorld. Boston, Jan. 10-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16-JAN. 22, 1994

Usenix Winter 1994 Conference. San Francisco, Jan. 17-21 — Contact: Usenix Association Conference Office, Lake Forest, Calif. (714) 588-8649.

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

Nomda/Landa Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: Nomda/Landa, Kansas City, Mo. (816) 941-3100.

JAN. 23-JAN. 29, 1994

Demo '94. Palm Springs, Calif., Jan. 23-26 — Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

ComNet '94. Washington, Jan. 24-27 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

10th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

The Fourth Annual Software Quality Conference. San Diego, Jan. 26-28 — Contact: Beck Eilman Agency, La Mesa, Calif. (619) 469-3500.

JAN. 30-FEB. 5, 1994

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact:

Management

Bureau of Educational Technology/Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12, 1994

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19, 1994

The 1994 Annual Healthcare Information and Management Systems Society (HIMSS) Conference & Exposition. Phoenix, Feb. 13-17 — Contact: Andy Pasternak, HIMSS, Chicago, Ill. (312) 644-4467.

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

The Sixth Annual Software Support Conference. San Francisco, Feb. 14-16 — Contact: Jan Rosenthal, Institute for International Research, New York, N.Y. (212) 661-3500.

Mobile World. Dallas, Feb. 15-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Distribution/Computer Expo '94. West Irvine, Calif., Feb. 16-17 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

Concepts '94. Orlando, Fla., Feb. 16-19 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

FEB. 20-FEB. 26, 1994

Share Winter 1994. Anaheim, Calif., Feb. 20-25 — Contact: Share, Inc., Chicago, Ill. (312) 822-0932.

Documentation '94 Conference & Exposition. Los Angeles, Feb. 21-25 — Contact: Graphic Communications Association, Alexandria, Va. (703) 548-2867.

MacFair '94. New York, Feb. 26 — Contact: New York MacUsers' Group, Inc., New York, N.Y. (212) 473-1600.

FEB. 27-MARCH 5, 1994

Reseller & Integrator Symposium on Document Imaging. Santa Clara, Calif., Feb. 28-March 2 — Contact: The Rheinner Group, North Scituate, Mass. (617) 545-7027.

Engineering Document Management Systems (EDMS) '94. Orlando, Fla., Feb. 28-March 3 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

Workflow '94. Boston, March 3-4 — Contact: The Conference Group, Scottsdale, Ariz. (602) 661-1260.

MARCH 6-MARCH 12, 1994

PC '94 Show. Sydney, Australia, March 8-11 — Contact: Eileen M. Lavine, Information Ser-

vices, Inc., Bethesda, Md. (301) 656-2942.

MARCH 13-MARCH 19, 1994

The BancA 5th Annual Executive Conference. Dallas, March 13-15 — Contact: BancA, Dallas, Texas (214) 788-0018.

The 14th Annual Conference on the Use of Clinical Information Systems. New Orleans, March 14-16 — Contact: Society for Clinical Data Management Systems, Los Angeles, Calif. (213) 224-6259.

MARCH 20-MARCH 26, 1994

UniForum '94. San Francisco, March 21-25 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

APRIL 3-APRIL 9, 1994

The Annual Computer Storage Exposition & Conference. San Francisco, April 5-7 — Contact: Sandi Eberhard, Eberhard & Co., New York, N.Y. (212) 486-6186.

APRIL 17-APRIL 23, 1994

ISCA '94: 21st International Symposium on Computer Architecture. Chicago, April 18-21 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Unix Reseller Conference. Dallas, April 18-21 — Contact: Expoconsul International, Inc., Princeton, N.J. (609) 987-9400.

Networks Expo. San Francisco, April 19-21 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

APRIL 24-APRIL 30, 1994

CHI '94: ACM Conference Human Factors in Computer Systems. Boston, April 24-28 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Africa Telecom '94. Cairo, Egypt, April 25-29 — Contact: Africa Telecom '94, Secretariat International Telecommunication Union-Place des unions CH-1211 Geneva 20, Switzerland, 41-22-730-58-11.

MAY 1-MAY 7, 1994

EDI '94. Orlando, Fla., May 4-6 — Contact: Data Interchange Standards Association, Inc., Alexandria, Va. (703) 548-7005.

MAY 22-MAY 28, 1994

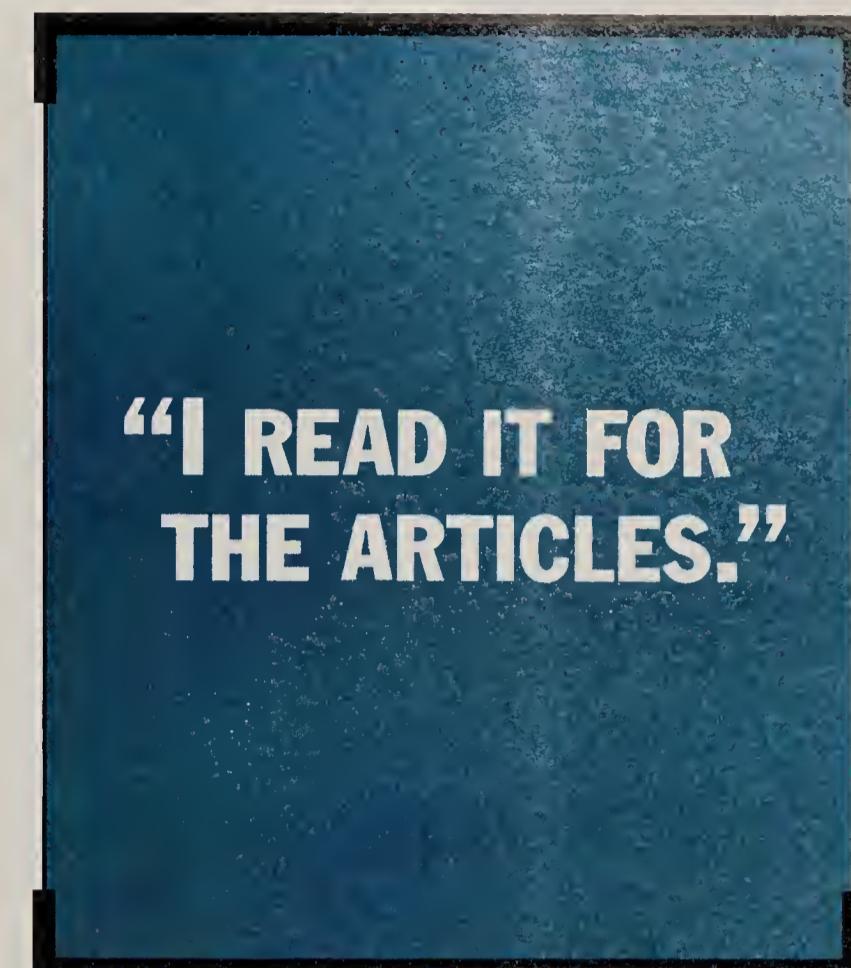
DB/Expo '94: Database, Client/Server, Technology Exposition & Conference. San Francisco, May 23-27 — Contact: Blenheim NDN, Inc., Mountain View, Calif. (415) 966-8934.

JUNE 19-JUNE 25, 1994

Elcom Asia '94. Almaty, Kazakhstan, June 21-24 — Contact: Fairtrade GmbH, Landhastrasse 13, D-69115 Heidelberg 49-6221-181935.

JULY 24-JULY 30, 1994

Interop '94. Tokyo, July 25-29 — Contact: Thomas Associates, Inc., Menlo Park, Calif. (415) 325-6236.



Management

Executive Track

Cargill, Inc. in Minneapolis recently hired John B. Bjelland as vice president of agriculture sector management information services and corporate information technology and application architecture.

Among other duties, Bjelland will oversee Cargill's transition from mainframe to client/server computing, a task he piloted at Grand Metropolitan in New York, where he was formerly vice president of worldwide application strategy.

Bjelland reports to Lloyd Taylor, Cargill's corporate vice president of information technology. Cargill is involved in the acquisition, processing, merchandising and storage of agricultural and other bulk commodities.

Joseph Rosen has been named managing director at Enterprise Technology Corp. in New York. He was formerly chief information officer at Dubin & Swieca Capital Management in New York.

Rebecca McPheters has been promoted to senior vice president, group executive, at The New York Times Co. Women's Magazines. She was formerly vice president of information services.

DuWayne Peterson, former Merrill Lynch & Co. chief information officer-turned-consultant, has announced the formation of a new benchmarking consortium for banks and financial institutions. The group will focus on helping information systems organizations evaluate their performance. Michael Delia, Inc., a San Diego consultancy and developer of performance analysis software, will support **DuWayne Peterson Associates** in Pasadena, Calif.

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Intelligence Files

True value of client/server

Large corporations are finding that client/server computing offers few, if any, long-term cost advantages over other kinds of information systems, according to recent studies conducted by The Research Board, a New York-based IS research consultancy that works only with Fortune 100 firms.

The cost of mainframe, minicomputer-based and client/server computing will be roughly equivalent in as little as three years. While client/server systems may appear to offer lower hardware costs, these advantages are neutralized by other factors. Fortune 100 companies have found that in a five-year period, 60% to 80% of the actual cost of client/server computing is taken up by end-user support costs, administrative costs and other factors.

The true advantages of client/server computing over traditional mainframe or minicomputer-based systems lie in its friendlier interface and its ability to enable users to access information from multiple sources on one screen. Another important factor favoring client/server computing is that third-party software vendors are now putting their development efforts into client/server systems.

Source: The Research Board, New York

On the information highway

Businesses are getting into high gear to ride the information highway. A recently completed study by the Society for Information Management (SIM) revealed that more than half of the responding corporations were already working on implementing aspects of the information highway in their business.

The SIM study presents data gathered from senior technology executives at 320 U.S. corporations. These executives expect the information highway will be widely available within seven years but that it probably will not come about for at least 12 years.

The executives said they also expect businesses to benefit from the information highway far more than education or the general public; that the highway is essential for global competitiveness; that it will benefit data exchange more than business strategy; and that standards for highway use should be set soon.

Source: Society for Information Management

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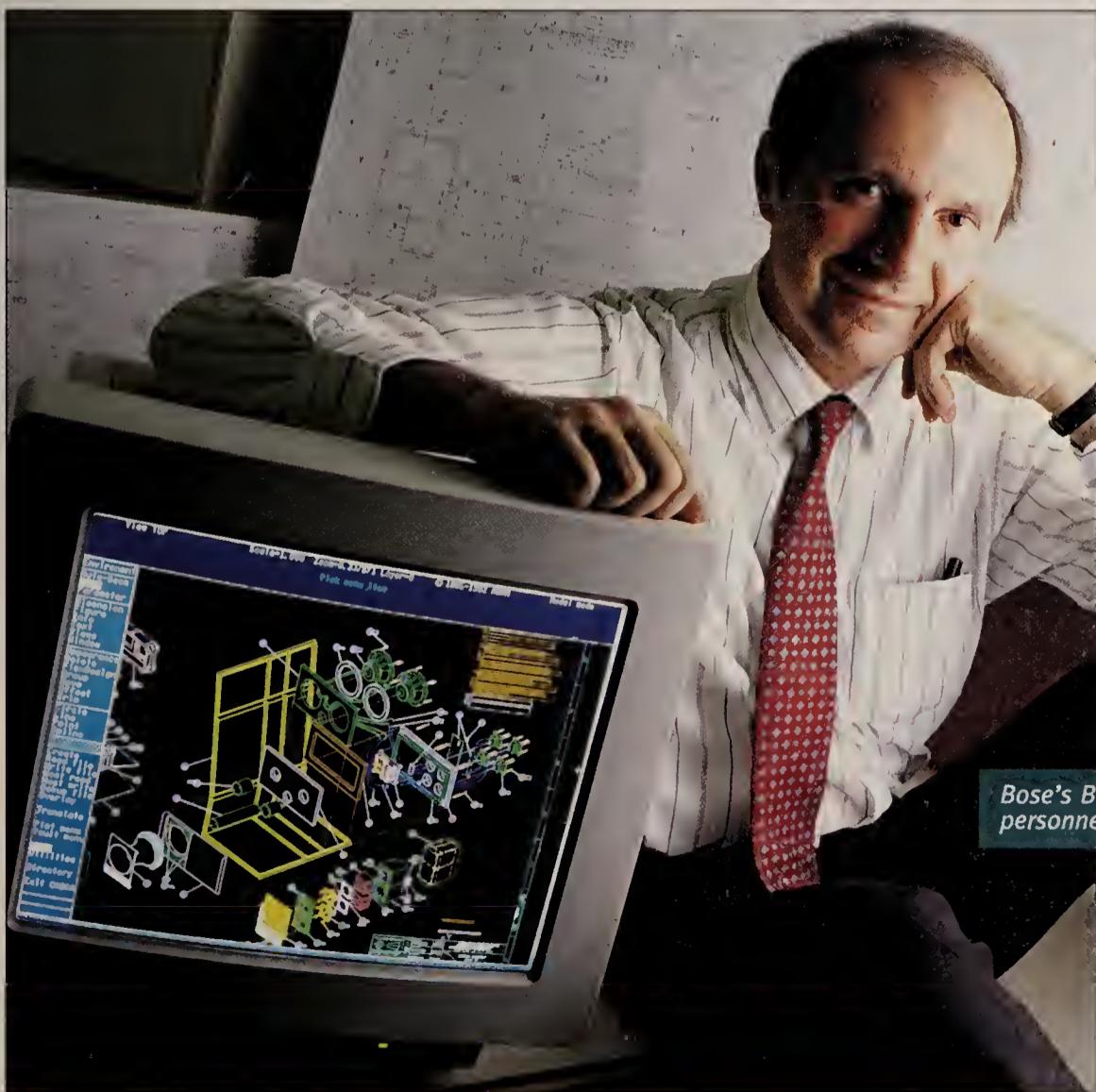


Re-engineering the Workplace

REDESIGNING DESIGN

**PRODUCT DESIGNERS
ARE TEAMED WITH
MANUFACTURING AND
MARKETING IN THE MOST
FORWARD-LOOKING COMPANIES**

BY JENNIFER DEJONG



Bose's Bill Canal is working to give plant personnel access to designs in progress.

Bill Canal has a funny story he likes to tell. Bose Corp., where he has worked for 18 years in various product engineering areas, once designed a tubular-shaped speaker called the Cannon. Intended for professional use, the speaker measured 12 feet long and one foot deep.

When it came time to roll out the cardboard packaging that had also been specially designed, there was a problem: The box was so large that the plant aisles weren't wide enough to accommodate it.

The speakers were finally packaged, and luckily for Bose, the event was more of an annoyance than a disaster. But it was also a strong early warning that something had to change: The manufacturing plants had to get better and quicker access to what the design group was doing.

Bose heeded the warning, and Canal is now heading up a system installation that will ensure the box mistake isn't repeated. From Mexico to Ireland to Quebec to Arizona, plant workers will always know beforehand what's going to emerge from the product designers in Massachusetts.

The data management system will alert them to things like packaging size while the cardboard box is still a computer-aided design (CAD) drawing on the designer's workstation.

Redesigning design, page 89

WILLIAM HAPPEL

```
Sub SAVEFILE = 1
Function FileOpener (New
ger, Confirm As Integer)
    Dim NewFileNum As I
    Dim Action As Intege
    Dim FileExists As Int
    Dim Msg As String
    On Error GoTo OpenerE
End If
End If
Global variables to hold the file number and record number
If Not FileExis
    = "The
    = MSG
```

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Re-engineering the Workplace

Redesigning design

CONTINUED FROM PAGE 87

Bose, the world's largest maker of music loudspeakers, tackled its design process problem before it reached a crisis point.

But many other U.S. manufacturers are under the gun to meet the demand of fast-moving markets, ferocious pricing pressure, fragmented customer tastes and intense competition.

The best route to survival, they're finding, is to tear apart and rebuild their approach to product design.

"Design is [a process of] problem solving. The visual aspect is just one part of it," says Sohrab Vossoughi, president of Ziba Design, a Portland, Ore., firm that designs consumer, medical and industrial products, ranging from small computers to athletic shoes for clients as diverse as Apple Computer, Inc. and Nike, Inc.

Designers wear many hats

These days, industrial designer Michael Laude spends a lot of time talking about target customers, changing channels and plunging price points. The Black & Decker Corp. engineer isn't changing careers; he just spends a lot of time, either on electronic mail or on Lotus Development Corp.'s Notes, with the folks in marketing and finance.

Laude is one of six members of the "cleaning products" business team, which counts among its ranks a general manager, a director of engineering (Laude himself), a director of marketing and a representative each from finance, manufacturing and quality.

The team designs, manufactures, markets and sells the Dustbuster and other handheld vacuum cleaners. Like its three counterparts in the household products area, it's responsible for its own profit and loss.

DESIGN INNOVATORS



BLACK & DECKER uses a team approach to design toasters and other small appliances. The Household Products Group has already cut one year off its three-year cycle of getting irons, food processors and handheld vacuum cleaners out the door. It's working to further reduce time to market to one year.

THE TECHNOLOGY TO DO IT



Product data management systems are often built in-house, but there are commercial systems available, as well.

Some of the available product data management systems include Structural Dynamics Research Co.'s DCMS; Sherpa's Product Information Management System; Hewlett-Packard Co.'s Project Management Control System; IBM's Product Data Manager; and FileNet Corp.'s Work Management.

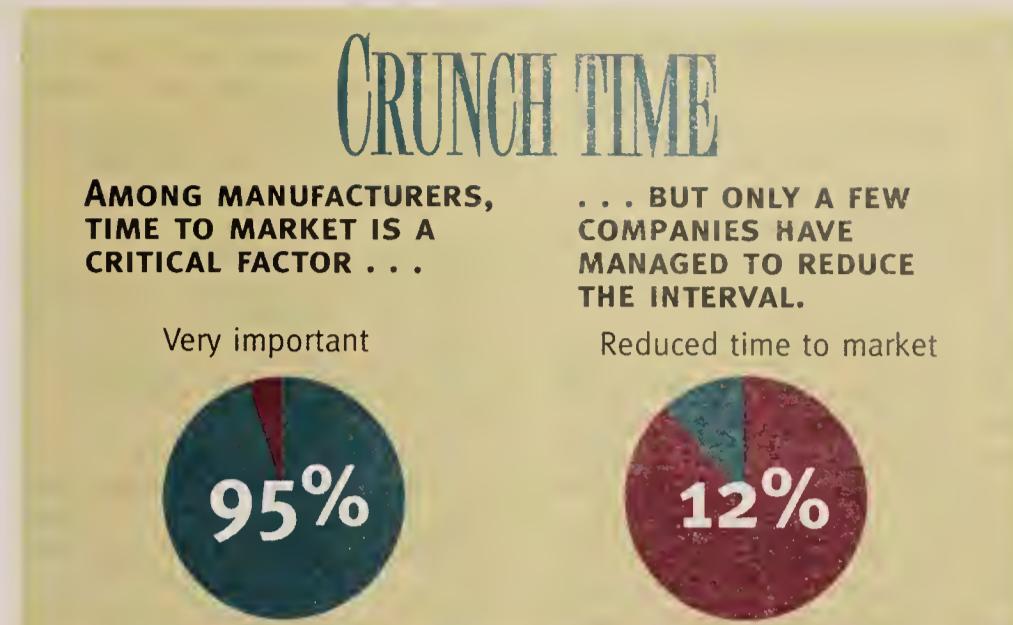
Almost all suppliers of CAD software have some sort of data management component as well, including vendors

such as Computervision and Intergraph Corp.

When it comes to enterprise data management systems, most companies turn to integrators or product data management vendors because of the high degree of customization involved.

In an enterprise data management system, the product data management component is wired together with companywide tools, such as design, operations, logistical support or desktop tools.

The enterprise system uses the engine of the product data management system to store information about



SOFTER MANUFACTURING, TOO

AMONG SOFTWARE VENDORS, THERE'S GREAT INTEREST IN USING DESIGN AUTOMATION ...

... BUT ONLY A FEW HAVE FORMAL PLANS IN PLACE.

Design automation	46	Pursuing but have no plans	43
Total quality management	18	Formal plans in place	3
Electronic data interchange	18	No plans to implement	6

Response base: 52 software vendors

Source: Pittiglio, Rabin, Todd and McGrath

expensive not only in terms of operations costs but also in the length of time it takes to get the product to the customer.

So far, the team concept has cut one year off Black & Decker's three-year cycle time, which extends from the formulation of a preliminary marketing plan to the day the product ships.

That's impressive, but it's still too long for the fierce business climate in which

the company competes. In the small appliance market, margins are as thin as 10% to 15%. One blender looks just like the others, and brand loyalty is a thing of the past.

Black & Decker needs to further trim cycle time to just one year and also reduce the number of products that are returned under warranty. Both are likely to

Redesigning design, page 90

- A product data management tool.
- A manufacturing engineering assemble/process planning tool.
- A manufacturing/material control tool.
- An enterprisewide master scheduling and resource planning tool.
- An enterprise software integration tool that performs middleware functions to give the above tools a consistent view for all users in the entire enterprise.

Written by Randy Muns, president of Horizon Technologies Group, a design consulting group in Fort Worth, Texas.

Redesigning design

CONTINUED FROM PAGE 89

begin happening early in 1994, when each team in the Household Products Group starts to use a custom-developed "product information management" system.

Product information management systems — also known as electronic data management and product data management tools, depending on who's offering it — are systems that store, route, track and update every drawing and document that makes its way through the design process. Documents can include such items as CAD drawings, product specifications, customer requirements and parts lists.

Like a work-flow management system, these systems shepherd documents and changes to documents to the people who need to see them. If the specs in a particular CAD drawing change, associated documents will be updated.

In addition, people from various disciplines can see the current version of one another's work, ensuring that the pieces

of the product fit together.

At Black & Decker, the system also electronically generates a bill of materials, which will eventually feed automatically into the company's new manufacturing resource planning system.

Moving out to the enterprise

Integrating design engineers and manufacturers on a single system is about as far as most companies have gotten today. The future, however, is in enterprise data management.

With this type of system, the flow of data would begin with customer requirements. Teams would work on a conceptual design and then go back and forth with the customer to formulate a detailed design. The enterprise product data management system would provide a common view and a way for all parties to review and comment on the product throughout its life cycle.

Today, only a few full-fledged enterprise data management systems are in use for product design. "There are people who've grappled for six years with product data management systems," Muns says. "When you move up to the enterprise types of systems, we're just in

DESIGN INNOVATORS



the inaugural stage."

One of the reasons for the lack of progress is the immaturity of the technology, Muns says. "That's not to say people aren't spending a lot of money on these systems," he adds. Indeed, a product information system from Sherpa Corp. starts at \$20,000 to \$30,000. Taylor Archer, a founder of Horizon Technologies, says software prices can range up to \$100,000. Because of the huge amount of customizing and consulting needed, most systems range in the

THE ROVER GROUP LTD. is now using an electronic data management system from Computervision to track the design documents used for its Discovery line of sport utility vehicles. It now produces models in 36 months, a drop from seven years.

"Once you determine the process and define the steps, [the technology] is easy. It looks like a dance, but it's not," Laude says.

DeJong is a free-lance writer in Boston who frequently writes about re-engineering.

MEDICAL SUPPLIER PRESCRIBES DESIGN RX

No one can predict the outcome of the Clinton administration's proposed health care changes. But Medtronic, Inc. isn't waiting for the picture to clear; it's preparing now for the probable price shakeout it will face in the not-so-distant future.

The Fridley, Minn.-based maker of pacemakers is sure of one thing: Hospitals are going to demand lower prices for the pacemakers, heart valves and other medical devices they buy from the \$1.3 billion firm.

Automation efforts had been tried before at Medtronic, but nothing really took until upper management mandated a move on-line. The vice presidents saw plenty of room to cut costs by streamlining the product design and sign-off process.

It wasn't hard to see. Under the then-current design process, it took Medtronic 17 to 20 days just to finalize a CAD drawing for a product change. And no wonder: Every drawing had to be approved by eight separate people in engineering, manufacturing and quality assurance, which meant a paper chase around the world to Medtronic sites in Puerto Rico, the Netherlands and Phoenix.

"That's two days to get there, two to get back and one for the review," says Gale Zimmerman, manager of configuration assurance at the firm. The company was spending \$20,000 a year in shipping bills alone.

Medtronic has been using CAD tools since the 1970s. But each designer has been drafting alone at his workstation, drawing a single component that will eventually make its way into the final product. All interaction among the designers is manual.

The goal is to reduce the change cycle to 10 days by the end of 1995 and to five days by the end of 1998.

To do that, Medtronic is using an information management system from Sherpa in San Jose, Calif.



Medtronic's Gail Zimmerman says five days for approval of designs was much too long for today's market

To determine everyone's requirements, Zimmerman and his project manager Jim Drake formed a task team with the software engineers, quality managers, design engineers, network professionals and users of the system from all of the local divisions.

At this stage of the implementation, Zimmerman and Drake are loading in bills of materials, CAD draw-

ings, images and word processing documents pertaining to the release of a product. It's a cumbersome, manual process, but Zimmerman's confidence is high.

"I have upper management's buy-in," he says. "Without it, you won't succeed."

— Jennifer deJong

SIMPLE TRUTHS

Digital Delivers All the Elements Needed for Successful Client/Server Computing

"Our organization today is a strong marriage of innovative technology — past, present, and future — and an unwavering focus on individual customer needs. We will lead the way to a new era of open client/server computing."

ROBERT PALMER, PRESIDENT AND CEO
DIGITAL EQUIPMENT CORPORATION

Did you know?

- ▶ Digital has made client/server computing its single business focus.
- ▶ Digital has grown its client/server-based systems integration capabilities into a \$2.3 billion business.
- ▶ Digital has implemented successful client/server solutions for a broad range of businesses, including Tyson Foods and Pitney Bowes.

The truth of the matter is that open client/server computing is at the very heart of what Digital is all about. It is the basis of our strategy to provide you with complete customer satisfaction, so that you can achieve your business goals today — and well into the future.

Client/server computing gives a company the means to make the most of all its resources: information, capital, technology — and most of all, people. It is helping people to work cross-functionally to improve customer service; to participate in international teams to enhance quality; to apply information in new ways in order to create innovative and unique products; to redesign and streamline processes, thus reducing time-to-market and improving profitability.

Ultimately, client/server computing allows you to make business changes very fast — in response to changing business conditions. And that ability is what keeps you competitive.

How does Digital plan to deliver all these client/server computing promises? Our strategy is based on the following three principles:

We deliver the best and most comprehensive portfolio of open client/server technology solutions. We make it our business to know your business, by defining and implementing an organization that is focused on specific industries and accounts. We have expertise and support that is unmatched in the industry.

Delivering "No Compromise" Open Client/Server Technology

Digital continues to provide you with outstanding value in technology via:

▶ An extensive portfolio of application software through collaboration with major developers

Digital is partnering with key application vendors such as ASK Group, Cincom, Cyborg Systems, Inc., Parametric Technology, ROSS Systems, SAP, SAS Institute, Shared Medical Systems, Welty-Leger Corp., and WordPerfect, Inc., to provide a broad range of applications for industries, including aerospace, automotive, banking, education, engineering, healthcare, retail/wholesale, telecommunications, and many others. In addition, 3,000 applications to date have been ported to our revolutionary Alpha AXP platform — a platform that is scalable from desktop to mainframe.

▶ Easy, open sharing and access to information in a multivendor environment — enabling you to link people in cross-functional processes

Introducing LinkWorks. The fact is that there is no other software in the industry that can do what it does. We define LinkWorks as an "enabling tool" that can be integrated with a wide range of Digital and third-party software and adapted to virtually any industry application. LinkWorks will benefit your business by helping overcome communication barriers between workgroups, improving security and management of PC networks, simplifying access to information, and streamlining business procedures.

The PATHWORKS product family, Digital's PC networking and integration software, allows you to dramatically simplify network management across all your network operating systems (NOS). And, with PATHWORKS software, you can use whatever NOS commands you want to manage all of them.

Digital's framework for data access and integration, ACCESSWORKS, provides directory services so that a client system can find the data you need, and translation services so that the data you request arrives in the format you need. It is based on existing SQL standards and other developing standards such as ODBC.

Digital works with its database partners to provide the "plugs" that let you access best-in-class database management system servers and integrate them into your client/server environment.

We've even got mobile users covered — with mobile and wireless solutions that provide location-transparent application access for rapid access to network resources.

▶ The comprehensive ability to integrate current and future technology into your existing environments with minimal effort and downtime

Digital's client/server philosophy is based on a multivendor environment. In fact, a distributed computing environment is assumed with all Digital software products.

OBJECTbroker is the industry's first CORBA standard product — allowing existing applications to be encapsulated and accessed as objects. Source code is not necessary. Through this product, Digital gives you a very simple mechanism for integrating current as well as future applications into a full client/server implementation.

▶ The best price/performance everywhere

For today and for the future, Digital's Alpha AXP systems are and will be the performance platform for client/server computing. We offer a complete line of UNIX Alpha AXP workstations and a scalable line of dependable servers that offer the best performance at every price point. Plus, we'll continue to offer a full line of price-competitive Intel-based PCs and servers.

▶ Exceptional system availability and data security

In an OpenVMS VAX environment, Digital has long offered the premiere functionality for mainframe computing — particularly in a distributed environment. With Digital's October client/server announcements, this capability has been ported from the VAX platform to the Alpha AXP platform. In addition, we have delivered on our commitment to port this industry-leading capability to the UNIX operating system on the OSF/1 platform. But we won't stop there. Digital will also be porting this capability to the Windows NT operating system in the future.

We're Focused on Your Business Needs

Bob Palmer said it best. "The object of our renewed focus and direction is a single principle: customer satisfaction." Before Digital can offer you the best client/server solutions for your business, we need to understand your business and the issues that surround it. That's why we've restructured our organization into specific industry-focused business units. We also understand that no two companies within the same industry are alike. As a result, we have implemented industry-organized account management so that the specific needs of each of our customers are fully met.

Extensive Support, Unmatched Expertise

Let's talk about experience. Digital is ranked among the top two client/server-based systems integrators worldwide — and has a systems integration business totaling more than \$2 billion. We've installed more than 100,000 networks, and networked more than 1 million systems. In short, we have the commitment, strategy, and experience to deliver the best and most comprehensive range of client/server solutions.

Digital also provides the most capable one-stop service for a multivendor environment. And we can prove it. We support:

- All major PCs, PC LANs, and PC applications
- The broadest range of UNIX systems and applications
- 14,000 products from 1,300 vendors
- Environments including IBM, Hewlett-Packard, Sun, UNISYS, CDC, Wang, and many more

In addition, along with Digital's 35,000 support professionals located worldwide, we are building a staff of 7,000 trained systems integration specialists dedicated to implementing your open client/server environment. ■

digital

Whether your server is CI- or SCSI-based, Digital has a solid state disk to meet your business requirements. For CI-based systems, the industry workhorse ESE50 solid state disk is ready to balance CPU speed with lightning-fast I/O. For SCSI-based servers, the EZ5x family of solid state disks is available to supply your most access-time-critical data.

Either way, your client/server computing environment benefits. The ESE50 solid state disk provides 1 gigabyte of nonvolatile capacity to meet your growing database and application needs — and does so at a very competitive price. The EZ5x products support your migration to open SCSI 2 standards and feature StorageWorks packaging. In addition, an integrated Data Retention System with continuous backup is built in to support a virtually limitless number of power failures.

The best news? Both of these high-performance solid state disk products are available for your client/server computing environment today.

You Ask — We Answer

With so many different storage products on the market, you may be asking yourself some important questions. Why solid state disks for my client/server environment? And next — why Digital? Here, we answer those questions, plus a few more.

Why should I consider solid state disks?

There's no doubt about it. The "output" of computing is becoming more and more important to businesses today. In some cases, the output is the business — and optimum performance is the requirement. Solid state disks provide the lightning-fast access to data (beyond the capability of traditional storage) to unleash maximum CPU power and application performance.

DO YOU HAVE A

CLIENT/SERVER ENVIRONMENT

THAT'S HUNGRY FOR FAST I/O?

Serve Up Digital's High-Performance Solid State Disks



Today's client systems are faster than ever. And multiple clients, running more and more distributed applications, are placing an ever increasing strain on the server's ability to deliver data to them. In order to optimize the power and performance of your client system, you need to make sure I/O doesn't become bottlenecked. Solid state disks from Digital can help you distribute critical information when and where you need it.

What about price?

Today, Digital's solid state disks are only one-ninth the cost of earlier models (based on \$/MB). Through experience and value engineering, we're bringing products to market at prices that allow more and more businesses to utilize the technology. The benefits and fast payback derived from devices purchased "yesterday" for mainframe-class applications can now be realized even sooner on today's client/server platforms.

How do I choose between ESE50 and EZ5x solid state disks?

That's easy. The ESE50 solid state disk provides the highest performance and capacity. And its redundant power supply feature offers the highest availability. If you're already implementing HSC and KDM70 controllers, the ESE50 solid state disk is the choice. If openness is a requirement, the EZ5x solid state disk provides the lowest entry cost and the flexibility of StorageWorks packaging. Cost differential has been removed from the decision. For higher-capacity configurations, the net \$/MB cost of the devices is about equal.

Can ESE50 and EZ5x solid state disk drives be used in the same cluster?

Absolutely. The devices plug-and-play beautifully together. The return on your investment in HSC-connected storage continues with the ESE50 solid state disk. And, should SCSI 2 devices be part of your future storage strategy, the EZ5x solid state disk can be added in easily.

What if my client/server applications are based on DSSI storage?

No problem. Digital's got you covered with our native-mode EF5x series of products to support your DSSI system.

For more information or to order Digital's ESE50 or EZ5x solid state disk products, call 800-DIGITAL (800-344-4825) and reference code BFQ. ■

PRODUCT/ORDER NUMBER	U.S. LIST PRICE
ESE50 SOLID STATE DISKS*	
ESE50-AA (120 MB)	\$40,000
ESE50-BA (600 MB)	\$105,000
ESE50-CA (120 MB to 600 MB Upgrade)	\$80,000
ESE50-DA (1 GB)	\$135,000
EZ5X SOLID STATE DISKS*	
EZ51R-VA (107 MB)	\$13,999
EZ54R-VA (428 MB)	\$47,099

* All models contain Digital's integrated Data Retention System to provide the nonvolatility of a magnetic disk if power is lost.

SDI AND SCSI SOLID STATE DISKS AT-A-GLANCE

	ESE50 SOLID STATE DISK	EZ5X SOLID STATE DISK
Interconnect	SDI	SCSI 2
Access Time	0.25 millisecond	<1 millisecond
I/O Throughput	1,800 I/Os per second	800 I/Os per second
Potential*		
Capacity	120 MB – 1GB	107 MB – 428 MB
Packaging	Storage Array Building Block	StorageWorks Building Block
Availability	Integrated Data Retention Systems	
	Redundant Power Supply	Continuous Backup
Pricing Schedule	DBA (Digital Business Agreement)	DPP (Digital Pricing Program)

*Will vary by CPU, application, adapter, and workload

OPEN THE DOOR TO SUCCESSFUL ELECTRONIC DATA INTERCHANGE

INTEGRATION IS THE KEY — AND DIGITAL HAS IT

Imagine conducting interactive electronic data interchange (EDI) with your customer from start to finish in just 6 seconds. Imagine automating the purchasing process with your suppliers — using EDI from purchase through payment — and realizing 20-to-1 savings. Imagine moving to client/server EDI, off-loading your IBM mainframe, and getting fully audited EDI transactions to and from the mainframe application.

Just think of the savings in time, the significant enhancements in the business cycle, the improved trading partner relations, and, most important, the savings to your company's bottom line.

You don't have to imagine any longer. The above results are real — accomplished by Digital customers using the DEC/EDI portfolio of products and services. The key to EDI success is integration. That's why our portfolio consists of products with superior integration features, plus services that maximize the integration of EDI into your business process.

And who better than a major user of EDI and a leader in systems integration to provide you with the most integrated EDI environment. Digital began using EDI in 1984. We developed and enhanced DEC/EDI software to run our own business, with much success. Today, we're putting that experience and success to work for you.

How EDI Enables Business Improvements

EDI is a form of Electronic Commerce. Specifically, EDI is the automated, computer-to-computer, application-to-application exchange of structured business data between a company and its suppliers, customers, banks, and other trading partners. The data are structured according to standards and represent common business transactions such as purchase orders, invoices, remittance advice, and many more.

But EDI is not the goal itself. It is the key technology that — combined with application integration and other technologies — enables business process improvements, such as just-in-time programs, quick response service, continu-

ous inventory replenishment, cost reduction programs, total quality management, and better cash management.

These improvements are made possible when EDI provides multiple levels of integration, such as integral communications and auditing, application integration across platforms, and integration with workflow, electronic mail, and the X.400 and X.435 international standards.

DEC/EDI products and services do it all. With integrated management and auditing features throughout, the DEC/EDI environment provides the means for EDI transactions to be sent and received, translated, and integrated with applications — including applications on IBM mainframes. In addition, the DEC/EDI portfolio makes integration with electronic mail and messaging a reality.

DEC/EDI Portfolio Integrates with Applications on Digital and IBM Platforms

The DEC/EDI portfolio consists of a comprehensive set of client/server products and services, including:

DEC/EDI Software

DEC/EDI software is composed of three distributable components — communications, translation, and application software servers — that work together to serve the needs of client business applications. DEC/EDI software supports multiple VAN services and direct links, and the X.400, X.435, X.25, OFTP, and bisync protocols. It also supports national, international, and industry-specific EDI syntax standards, including EDIFACT, ANSI ASC X12, ODETTE, and TRADACOMS.

A by-pass capability allows nonstandard or existing EDI systems to participate in the DEC/EDI environment — ensuring protection of your previous investment. DEC/EDI software allows integration of existing and new applications and tracks transactions to and from each application.

FileBridge for DEC/EDI Software

FileBridge for DEC/EDI software — a table-driven, file-based bridge or "mapper" between

DEC/EDI software and applications — tightly integrates data into applications, in the format that each application requires. FileBridge for DEC/EDI isolates the mapping process from the business application, minimizing the programming and support required to add new trading partners, to handle varying EDI standards and versions, and to maintain the overall system.

HostBridge for DEC/EDI

HostBridge for DEC/EDI consists of client/server software and services that integrate EDI transactions into applications on IBM MVS-CICS, MVS-Batch, and VSE-CICS mainframes with the same auditing and tracking as with Digital-based applications.

DEC/EDI-ready Third-party Applications

These applications are ready to use with the DEC/EDI product and are pre-mapped using FileBridge for DEC/EDI software. They include:

- Integrated Accounting System (CODA, Inc.)
- Renaissance Financial Series (ROSS Systems)
- DCS/Logistics (Andersen Consulting)
- Mancos (Mancos Computers)
- MDS (Distribution Architects International)
- Distribution Series (ROSS Systems)
- TOLAS (GSI)
- CONTROL:Manufacturing (Cincom)
- MAXCIM, MANMAN (ASK Computer Systems)
- PROMIX (ROSS Systems)
- TROPOS (Strategic Systems International)
- ALLEGRA (SMS)
- Alliance (ASA International, Ltd.)
- POWERDOC·EDI (Fraser Williams)

"Having used EDI for more than one year, we anticipate saving about 700,000 pounds (\$1,333,000) annually. For each pound invested in EDI, we will be getting 20 pounds in operation savings."

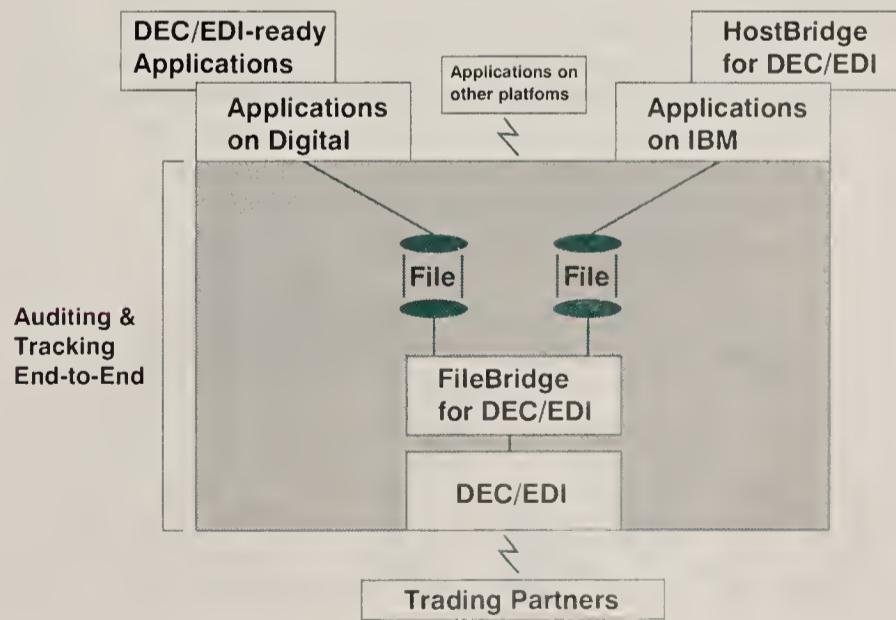
NEIL WILSON
DIRECTOR OF FINANCE
NORWICH HEALTH AUTHORITY

Digital's support for the X.435 standard enables businesses to send and receive EDI transactions over the same network that carries their electronic mail. As a result, companies can implement a single, enterprise-wide messaging system for global Electronic Commerce.

According to the Gartner Group, "Companies can cut their costs of implementing EDI and messaging by using a common network for both types of messaging. This is a direct savings that results from beginning with an X.435 product as the base."

And bringing it all together is what Digital does best. We integrate EDI and messaging, EDI and multivendor applications, and EDI with your business — for bottom-line results.

For more information on Digital's DEC/EDI portfolio of products and services, call 800-DIGITAL (800-344-4825) and reference code BFK. ■



EDI INTEGRATION AT ITS BEST

DEC/EDI is client/server software with integrated communications, translation, and application services, plus strong auditing and tracking. Transactions map to applications via FileBridge for DEC/EDI; third-party DEC/EDI-ready applications come pre-mapped for the quickest implementation. Transactions integrate with IBM mainframe applications via HostBridge for DEC/EDI, which includes client software residing on the mainframe.

digital

The World at Your Desktop

Digital's Network Interface Cards Give You All the Right Network Connections

NO MATTER WHERE YOU ARE — in the next office or on the other side of the world — Digital's complete line of network interface cards (NICs) keeps you in constant touch with critical data you need from your workstation, Alpha AXP server, or PC.

And because we understand that all desktop environments are not alike, Digital has designed products that are truly open. Whether you choose the Digital's EtherWORKS family of Ethernet NICs or Digital's FDDI family of NICs for high-speed network computing, you'll receive network device drivers that support multiple operating systems, network operating systems, system buses, and connections. Our network interface cards support such leading standards as Ethernet 802.3, 10BaseT, 10Base2, and ANSI FDDI — including the draft TP-PMD standard.

Digital's NICs:

- Operate with today's major PC operating systems, including PATHWORKS, NetWare, LAN Manager, SCO UNIX, and Windows NT, DOS, and OS/2 environments
- Provide support for ISA, EISA, TURBOchannel, and Micro Channel bus architectures
- Offer cabling connectivity for unshielded twisted pair, shielded twisted pair, and ThinWire and thick wire Ethernet, as well as multimode FDDI fiber-optic installations

Digital's third-generation NICs are also 100 percent compliant with server and client drivers for all major network operating systems.

Third-Generation Ethernet NICs Offer Leadership Performance

The DEC EtherWORKS 3 family of PC NICs, a portfolio of eight network interface cards, offers industry-leading performance and built-in reliability — allowing you to connect to local and wide area Ethernet networks right from your desktop. As Digital's third-generation network interface card, the DEC EtherWORKS 3 family of NICs incorporates the latest applications specific integrated circuitry (ASIC) technology in a Digital-designed chip. The result? Significant capabilities that result in outstanding performance.

By offering shared memory architecture with 128 KB of on-board packet buffer space, DEC EtherWORKS 3 NICs require fewer system buffers — allowing conservation of precious CPU memory. Plus, built-in dynamic memory management allocates buffers for transmitting and receiving as needed — resulting in automatic tuning and optimal performance, even with heavy network traffic. And, the parallel processing capability of our DEC EtherWORKS 3 NICs allows them to outperform the competition

through their ability to process, transmit, and receive packets concurrently.

But wait — there's more. Digital's third-generation NICs are also 100 percent compliant with server and client drivers for all major network operating systems. And, to top it off, they're simple to install. A set of online instructions makes our NICs very easy to configure.

FDDI NICs Fill Your Need for Speed

If it's speed you want — now you've got it. By connecting the computer system to an FDDI ring, Digital's FDDI NICs bring standards-compliant, 100 Mbits/second speed to your workstation, Alpha AXP server, or PC. These NICs are particularly suited for delivering FDDI bandwidth and performance to users running high-speed image and data transfer applications (such as CAD/CAM, medical imaging, molecular modeling and display, video conferencing, and more), as well as very high-volume data processing, multimedia, backup, and client/server applications.

An on-board processor for SMT ensures no extra load on the CPU and keeps CPU utilization to a minimum. Each FDDI NIC utilizes a Digital-developed ASIC for full 32-bit bus master direct memory access (DMA). Combine this with 1 MB of on-board memory and you get industry-leading performance.

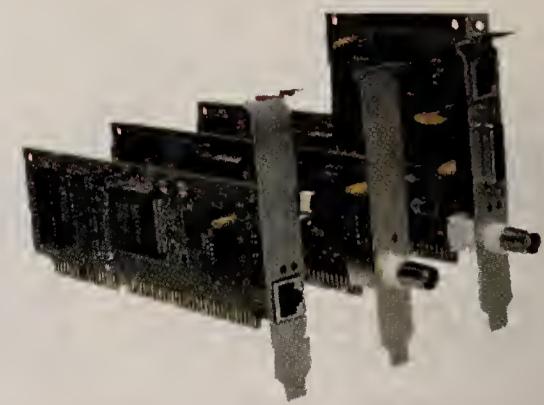
Our FDDI NICs also give you configuration options. Your system can be configured as Single Attachment Station (SAS) or Dual Attachment Station (DAS) — providing you

with critical network flexibility. These options support full-duplex FDDI for simultaneous transmit and receive of packets — a process that increases throughput and decreases network latency in point-to-point connections. In fact, once full-duplex mode is enabled, the maximum throughput of Digital's FDDI NICs increases from 100 Mbits/second to 160 Mbits/second. No other FDDI NIC in the industry has achieved that kind of performance.

In addition, the manageable ring purger feature — available only in Digital FDDI NICs — enables them to automatically remove stray frames from the FDDI ring, ultimately increasing the ring's performance.

Like our DEC EtherWORKS 3 NICs, Digital's FDDI NICs are easy to install, easily manageable, through both local or remote means, and Novell and PATHWORKS certified.

To order any of Digital's DEC EtherWORKS or FDDI network interface cards, call 800-DIGITAL (800-344-4825) and reference code BFR. ■



DEC EtherWORKS 3 NIC

PRODUCT/ORDER #	PRICE
DEC FDDIcontroller/EISA SAS (DEFEA-AA)	\$1,500
DEC FDDIcontroller/EISA DAS (DEFEA-DA)	\$2,500
DEC FDDIcontroller/EISA UTP (DEFEA-UA)	\$895
DEC FDDIcontroller/Q-bus SAS (DEFQA-SA)	\$4,500
DEC FDDIcontroller/Q-bus DAS (DEFQA-DA)	\$6,300
DEC FDDIcontroller/TURBOchannel SAS (DEFTA-FA)	\$2,250
DEC FDDIcontroller/FUTUREBUS+ SAS (DEFAA-AA)	\$8,995
DEC FDDIcontroller/FUTUREBUS+ DAS (DEFAA-DA)	\$9,995
DEC FDDIcontroller 400 (DEMFA)	\$17,910
EtherWORKS 3 TURBO (DE203-AB)	\$155
EtherWORKS 3 TURBO TP(DE204-AB)	\$155
EtherWORKS 3 TURBO PLUS (DE205-AB)	\$185
EtherWORKS 3 TURBO Remote Boot ROM (DE20M-AR)	\$40
EtherWORKS MC (DE210-AB)	\$375
EtherWORKS MC/TP (DE212-AB)	\$410
EtherWORKS EISA TP/BNC (DE422-SA)	\$525
EtherWORKS Pocket Adapter/TP (DEPEA-AA)	\$299
EtherWORKS Pocket Adapter/BNC (DEPEA-BA)	\$299

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Staying ahead in consumer electronics — by design

By Lou Lenzi



FIRST PERSON

It seems everyone wants to buy a color television set these days. Business is booming. But while demand for TV sets is almost outstripping supply, profit margins are being squeezed by near-suicidal retail pricing.

What's to blame? An oversaturated retail environment and too many brand names fighting for consumer attention.

From my standpoint as a product developer working in this market, survival depends not only on getting products to market quickly but also on introducing innovative new products and features and cost-reduction programs to offset retail price erosion.

As a result, our company has invested heavily in technology and related process changes to maintain our leadership position in this tough market.

One area in which we've invested is the design and development of cabinet enclosures. This involves developing injected molded plastic parts and related tooling processes. Because plastics tooling is a long lead item requiring sig-

In 1973, a 19-in. TV set cost the equivalent of \$1,466 (in 1993 dollars). Twenty years later, the comparable product sells for about \$220, according to a recent issue of Fortune magazine. TV manufacturers are forced to innovate and slash prices despite "margins that make [those of] PC makers look healthy," Lenzi says. (Pictured is the newest RCA model.)



One company has gotten its design engineers so involved with marketing that the engineers are now the marketers.

At Ross Operating Valve Co., design engineers spend as much time on the telephone as they do on the dual-screen Intergraph Corp. CAD systems that sit on their desks. And that's fine because the

phone is their connection to the true designer — the customer who describes in detail the exact configuration of the pneumatic valve they want.

As the customer explains how he wants the valve ported (where the holes are placed) and how it will be mounted, the engineer is already at work, either designing from scratch or choosing appropriate parts from a library of stock components.

When the design is complete, the engineer develops a "tool path" pro-

nificant capital investment, this area has received a lot of attention in terms of new technology applications.

Refining design refinement

Our "team" approach to design refinement deserves a lot of credit for our current success. Personnel from marketing, engineering, manufacturing and sourcing follow the project from concept to production.

We've replaced time-consuming pencil-produced artist renderings with rough three-dimensional study models made of urethane foam. Accurate 3-D computer-aided design (CAD) wire frames are then created from these models.

The CAD database, used initially for technical analysis, can be transferred to a high-quality image renderer. Here, we use the output images for surface verification and interference checking, consumer research and sales and marketing reviews.

Costly step moved downstream

Note that we've created no hard models up to this point. All information is being communicated either with the handmade urethane mock-ups or CAD-based soft models.

The entire development team is on board with all critical issues identified. The tooling has been "source released" so a vendor can begin the tool design in parallel with the mechanical design. The final program go-ahead decision is made at this point.

What we've eliminated from this phase is the costly, time-consuming verification model.

Such a model will be built further downstream to verify surfaces prior to tool start and for "selling-in" the new product with retail buyers.

From this point, our process follows the more traditional product development cycle of tool release, initial tool completion, prove-in, preproduction and finally production.

Looking forward, one thing seems certain: The winners in the consumer electronics business will be driven by innovation, short development cycles and low product cost.

Lenzi is general manager, America's Design Operation, Thomson Consumer Electronics.

DESIGN INNOVATORS



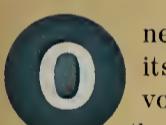
Industrial Designers Society of America

THE BIOJECTOR FROM BIOJECT, INC.

INC. is a noninvasive injection system intended as an alternative to the hypodermic needle. The first version was a market failure. It was difficult for doctors to use, and patients found it intimidating. "It looked like it would hurt you more than a syringe," says Sohrab Vossoughi, president of Ziba Design in Portland, Ore., which Bioject hired to help with the redesign.

Ziba worked side by side with the marketing, sales and engineering folks to come up with a friendlier looking version. The interactive design process resulted in an award-winning design that customers like.

ONE PNEUMATIC VALVE, TO GO



gram and processes the program into machine language. The instructions are then downloaded through a PC linked directly into the computer numerical control machining center.

Ross has been in the valve business for 71 years, producing air-control devices for manufacturers in the automobile, textile, steel and mining industries. Not all of its products are customized; many are still sold as stock products through catalogs.

But the days are gone when engineers would conceptualize in isolation, with only a hint from marketing as to what customers might need. The old process would require weeks and months of design and production.

Today, "the market is created before any product is produced," says Henry Duignan, chief operating officer at Ross. According to Duignan, Ross can make a prototype for \$3,000 in eight to 24 hours, compared with \$500,000 and six to 12 months to do same job six years ago.

—Mary Brandel

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Power play

Massively parallel processing promises mainframe power at a quarter of the cost. But trouble with multiple joins and poor file and record locking can bring systems crashing down.

By Andrew Boughton

Unless you've been in hibernation, you know that massively parallel processing (MPP) technology is being touted as hot, hot, hot.

Retailers such as Wal-Mart Stores, Inc., Kmart Corp. and Hallmark Cards, Inc. use MPP servers to handle large volumes of point-of-sale data for short-term product line forecasts. These forecasts form the basis of ordering and delivery schedules and are used for improved marketing analysis.

Deloitte & Touche has also taken the plunge: It uses a 640 MIPS machine that it hopes will eventually eliminate the millions of pages of reports it grinds out and distributes every two weeks.

But "hot" can also refer to all the hot air that MPP is generating. That's because while the technology promises companies the power of a mainframe at about a quarter of the cost, MPP still has many of the growing pains of an emerging technology, including poor systems management and shaky reliability. And, as the anchor for client/server computing, MPP is working under many of the constraints inherent in that environment.

Current users are on the bleeding edge. That leaves potential users wary, with many saying they will wait an average of 14 months to buy an MPP system, according to a recent study of 196 commercial sites by International Data Corp.

What follows on pages 98 and 102 are answers to commonly asked MPP questions about problems, MPP's effect on legacy systems and MPP's future.



DAVID CHEN

What about MPP and legacy systems?

M

oving from legacy systems to MPP can be surprisingly smooth but expect some hefty costs.

In most companies, MPP technology rarely replaces a mainframe. It tends to be more complementary with legacy systems than competitive, at least initially.

The information systems staff can load data from mainframes and minicomputers onto the MPP server while running old applications on the legacy machines.

Either a direct channel connect or networked solution bridges the old applications with the new relational database server.

MPP tends to be more complementary than competitive with legacy systems.

frame, which runs an old service application.

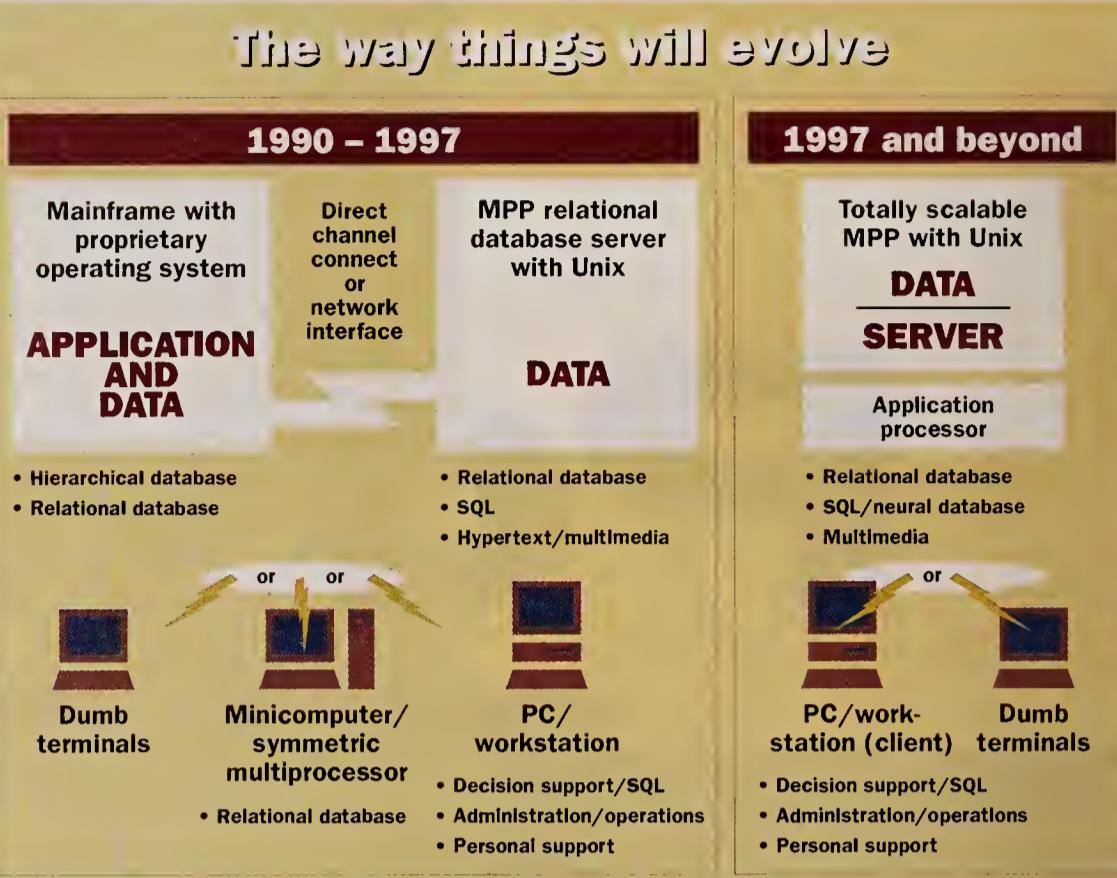
In this case, the MPP database server looks like a gigantic disk drive to the mainframe, while the database looks like a friendly mainframe to PC and workstation users.

So, applications on proprietary hardware can run against MPP databases. However, there is an important proviso here — there needs to be a high-speed interface to the platform of choice.

The cost of creating such an interface can run into the hundreds of thousands of dollars.

Easing the IS burden

Having such a link between old and new means that the IS staff can write new applications on smaller hardware platforms — typically PCs, workstations and minicomputers — for cutover in the future. This frees developers to work on new software technology under less stressful conditions.



Source: Andrew Boughton

Decision support applications on PCs and workstation platforms can immediately use the MPP data warehouse, with enhanced data access capabilities.

Decision support applications are equipped with SQL interfaces as well as data navigation tools. Even the old administrative applications can be retrofitted with SQL.

Suppliers going after the commercial market

N

CR Corp., Dayton, Ohio

Developed a dual high-speed bus across processing and storage modules to avoid contention on a single bus. Uses Intel Corp. chips. The Te-radata DBC machine, acquired by NCR, is compatible with the NCR 3600 range.

• Kendall Square Research Corp., Waltham, Mass. Developed a backbone of vast cache memory behind its multiprocessor and multistorage arrays to handle communications and I/O. The cache performs certain operations in live memory, reducing the frequency of disk access. The company claims to replicate in its architecture the shared memory environment of a mainframe with its sequential programming model. Kendall Square Research uses customized processors from Sharp Corp., around which it creates I/O and board circuitry.

• NCube Corp., Foster City, Calif.

Designed an architecture that ties processors in close proximity via a "hyperecube" structure. Very large-scale integration (VLSI) chips incorporate CPU, memory and communications processors on small boards with huge bandwidths between all processor and disk components.

• MasPar Computer Corp., Sunnyvale, Calif.

Developed a hardware architecture with a powerful chip set of multiple RISC processors. Software

features include a file storage pattern that enables users to store and access data in the same format as standard Unix.

• Encore Computer Corp., Fort Lauderdale, Fla. Linearly scalable RISC-based MPP systems, with a theoretical growth path of more than 200T bytes of disk capacity and highly scalable memory. Systems have a direct shared memory architecture that may eliminate the single point of failure problem inherent in some products. Encore is testing an enhanced implementation of Oracle 7.1.

• IBM, Armonk, N.Y.

Has commercial MPP applications evolving on two fronts. IBM's new eight- and 64-processor SP1 RISC machine is compatible with RS/6000 applications software and operates as a database server and a general-purpose computer-plus-server. The S/390 architecture already employs some parallelisms, using up to eight main processors. It supports Unix and MVS. IBM is reportedly developing a more parallel S/390 design incorporating hundreds of CMOS chips.

• Cray Research, Inc., Eagan, Minn.

Released a SPARC-compatible superserver this month with a range of four to 64 symmetric multiprocessors. Designed to work as a database engine with Sun Microsystems, Inc. workstation networks.

What is MPP?

The concept of MPP is simple: Take a number of processors and marshal them together to provide powerful and inexpensive large-scale computer systems. Because the componentry is microprocessor-based, it shares the low cost-to-power ratios of the PC. But MPP provides the capabilities of a flexible mainframe; it can, in fact, be considered a sort of "hypermainframe" with MIPS that can handle decision support and operational data.

MPP systems use standard redundant arrays of inexpensive disks (RAID) storage technology to achieve immense and reliable storage capacity — anywhere from 5G to 200G bytes. This capacity is linearly expandable with processing, memory and I/O power.

The systems typically run Unix on front-end processors, which are used as communications controllers, performance and administration monitors and staging platforms for porting application programs to parallel Unix and for interfacing with application programs on client platforms.

The reason MPP has become so attractive for commercial environments is that it is an enabling technology for data warehouses, which, by my definition, are large-scale relational databases that unify fragmented corporate databases. Such powerful database servers tend to operate within a client/server information systems architecture (see chart above). As such, they deliver easy, cost-effective access to huge volumes of data and impressive transaction processing performance.

MPP is the logical second half of the PC revolution because it gives the PC user a personal connection to the enterprise. The fact that it uses microcomputer technology both in the MPP server and PC client adds conceptual neatness to the story.

From a business perspective, MPP technology is about better decision support capabilities. Users get an unprecedented level of control of their operations because MPP frees up access to the information in a company's operational systems and enables intelligent processing of huge volumes of data and images.

Editorial Calendar (January-June, 1994)

Issue Dates	Ad Closings Color*	B&W	Editorial Features	Show Distribution	Ad Readership Study Issue	Response Card Deck
Dec. 27 & Jan. 3	Dec. 10	Dec. 17	Special Edition: Annual Forecast Issue			
Jan. 10	Dec. 24	Dec. 31	Closer Look: Object Database Management Systems		Starch	Mails: Jan. 12 Close: Dec. 11
Jan. 17	Dec. 31	Jan. 7	CW Guide To: Spreadsheets and Spreadsheet Utilities The New Capabilities <i>Buyers' Satisfaction Scorecard:</i> Windows Packages from Borland, Lotus, Microsoft, etc. <i>Firing Line:</i> Latest Windows Offering			
Jan. 24	Jan. 7	Jan. 14	Closer Look: ATM	ComNet Washington D.C., 1/25 - 1/27		
Jan. 31	Jan. 14	Jan. 21	CW Guide To: Departmental Servers and Superservers Matching a System to Departmental Needs (including Alpha, Tricord, Netframe, Sun, RS/6000, NCR, Sequent, Wyse, Compaq) <i>Buyers' Satisfaction Scorecard:</i> Leading RISC Servers <i>Firing Line:</i> Latest Server Product	Executive Technology Summit Tampa Springs, Florida 2/2 - 2/4		
February		Dec. 27	CLIENT/SERVER JOURNAL	All Shows Feb. - April	Harvey	
Feb. 7	Jan. 21	Jan. 28	Special Quarterly Report: Re-engineering the Workplace		Starch	Mails: Feb. 9 Close: Jan. 3
Feb. 14	Jan. 28	Feb. 4	CW Guide To: Management Tools for Large Networks What Works When Systems are Distributed <i>Buyers' Satisfaction Scorecard:</i> Multivendor Network Management Software from DEC, HP, IBM, Sun, etc. <i>Firing Line:</i> Latest Management Package	Networks Expo Boston, 2/15 - 2/17		
Feb. 21	Feb. 4	Feb. 11	Closer Look: Windows and OS/2 Imaging Software			
Feb. 28	Feb. 11	Feb. 18	CW Guide To: Work Flow Software The Reality Behind the Promises <i>Buyers' Satisfaction Scorecard:</i> Leading Work Flow Software Systems <i>Firing Line:</i> Latest Work Flow Managers	Groupware '94 Boston, 2/28 - 3/3		
Mar. 7	Feb. 18	Feb. 25	Closer Look: Desktop Laser Printers		Starch	Mails: Mar. 9 Close: Jan. 31
Mar. 14	Feb. 25	Mar. 4	CW Guide To: RAID Choosing Among the Various Levels of Disk Array Technology <i>Buyers' Satisfaction Scorecard:</i> Leading Server-based RAID Systems <i>Firing Line:</i> Latest Mainframe RAID Subsystem			
Mar. 21	Mar. 4	Mar. 11	Closer Look: Unix Workstations	UniForum San Francisco, 3/23 - 3/25		
Mar. 28	Mar. 11	Mar. 18	CW Guide To: Wireless Networks The Spectrum of Technologies, Including LANs, WANs and Radio Frequency <i>Buyers' Satisfaction Scorecard:</i> Leading Wireless LANs <i>Firing Line:</i> Wireless Services Product			
Apr. 4	Mar. 18	Mar. 25	Closer Look: Personal Productivity Software			
Apr. 11	Mar. 25	Apr. 1	CW Guide To: NT vs. OS/2 vs. Unix Desktop and Server Choices <i>Buyers' Satisfaction Scorecard:</i> Leading Server Operating Systems from IBM, Microsoft, Sun, etc. <i>Firing Line:</i> Latest Desktop Operating Systems from a Leading Vendor		Starch	Mails: April 13 Close: Mar. 17
Apr. 18	Apr. 1	Apr. 8	Management Special: IS Architecture in Times of Change	AIIM New York 4/18 - 4/21 SIM Conference Florida, 4/20 - 4/22		
Apr. 25	Apr. 8	Apr. 15	CW Guide To: Data Access Tools New Tools for Quick Access to Data Buried in Older Flat-file and Hierarchical Databases <i>Buyers' Satisfaction Scorecard:</i> Leading SQL-based Data Access Tools <i>Firing Line:</i> Latest Data Access Tool from a Leading Vendor			
May		Mar. 30	CLIENT/SERVER JOURNAL	All Shows May - July	Harvey	
May 2	Apr. 15	Apr. 22	Closer Look: Distributed Computing Environment	Interop + Network Las Vegas, 5/2 - 5/6		
May 9	Apr. 22	Apr. 29	CW Guide To: Mobile Computing From Notebooks to PDAs <i>Buyers' Satisfaction Scorecard:</i> Leading Notebook Computers <i>Firing Line:</i> Latest Sub-notebook Product from a Leading Vendor	International DB2 Users Group San Diego, 5/8 - 5/12		Mails: May 11 Close: April 14
May 16	Apr. 29	May 6	Special Quarterly Report: Re-engineering the Workplace		Starch	
May 23	May 6	May 13	Windows World Open Supplement CW Guide To: The Impact of OLE 2.0 What OLE can do for IS and How to Make Sure Your Favorite Desktop Software Vendor is Up to Speed <i>Buyers' Satisfaction Scorecard:</i> Leading OLE Applications <i>Firing Line:</i> Latest OLE Development Tool	Windows World Comdex Spring Atlanta, 5/23 - 5/26 DB Expo San Francisco, 5/24 - 5/27		
May 30	May 13	May 20	Annual Job Satisfaction Survey How IS Professionals and Managers Really Feel About Their Jobs and Careers			
June 6	May 20	May 27	CW Guide To: Distributed DBMS Selecting the Right Engine for a Distributed Database Architecture <i>Buyers' Satisfaction Scorecard:</i> Leading Relational DBMS <i>Firing Line:</i> Latest Relational DBMS Product	Computerworld Smithsonian Awards Washington, DC		Mails: June 8 Close: May 2
June 13	May 27	June 3	Closer Look: AS/400		Starch	
June 20	June 3	June 10	CW Guide To: Mainframes How Big Iron Vendors are Answering the Challenges of the Mainframe's Changing Role <i>Buyers' Satisfaction Scorecard:</i> Leading Mainframes from Amdahl, HDS, IBM, etc. <i>Firing Line:</i> Latest Mainframe Model			
June 27	June 10	June 17	Closer Look: PCMCIA Cards	PC Expo New York, NY, 6/28 - 6/30		

Editorial contacts (508) 879-0700 CW Guide: The Guide includes a package of articles on the stated topic, in addition to Buyers' Scorecard and Firing Line
 Features Editor: Joanne Kelleher, Management Features: Allan Alter, Closer Look: James Connolly, CW Guide Articles: Mary Brandel & Derek Slater, Buyers' Satisfaction Scorecard: Michael Sullivan-Trainer, Firing Line: Garry Ray

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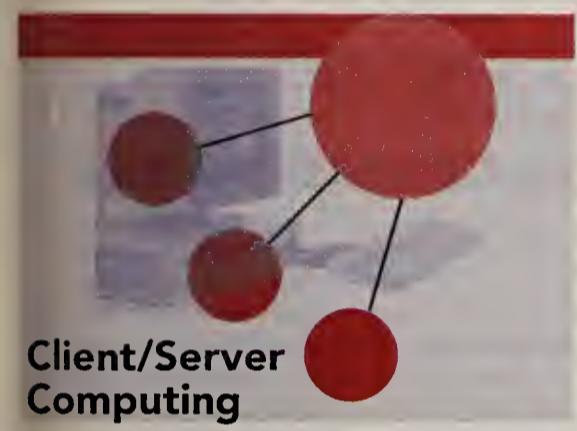
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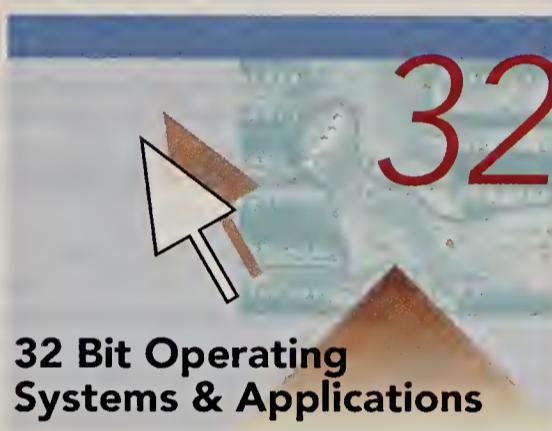
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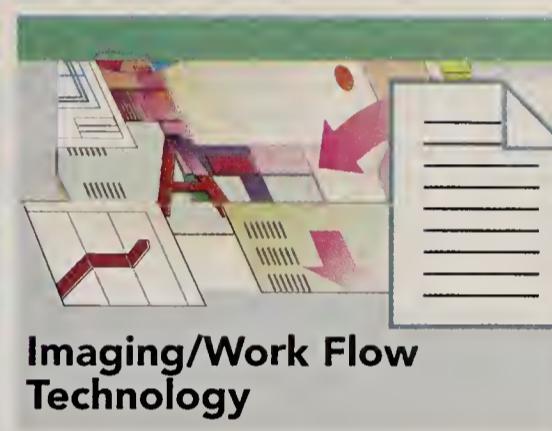
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What are MPP's problems?

Here are the key roadblocks to watch out for in MPP:

- **The lack of effective file and record locking facilities in some MPP databases.** This problem has caused major headaches because decision support scans and real-time transactions for multiple applications regularly collide. If your database architecture is not designed for general-purpose, mixed-load computing, you'll run into difficulties as you port more and more applications.

Some sites running a mixed work load against databases with poor file and record locking facilities report going down up to 15 times a day. That's because access contention results in a "deadly embrace" in which the system is unable to sort out the priority of competing instructions for two or more different users.

Even for those systems that automatically recover in a few seconds to a few minutes, things aren't peachy. Disks are left with a lot of junk data on them that the information systems staff must clean with tedious maintenance procedures.

To help solve contention problems and speed up performance, MPP databases are often stratified into levels of operations and decision support data. In this way, the company gets a hierarchy of increasingly aggregated or summarized decision data above the operational data on the server.

- **Lack of large-scale systems management facilities.** Systems administration software, network management and security for DOS and Unix have been poor on the MPP architecture to date. These problems have long plagued distributed PC-based systems.

- **Poor transaction monitoring facilities and performance levels on some architectures.** Because simple transactions such as order processing cannot take advantage of a parallel architecture (the transaction is so simple you can't spread the load across processors), such transactions tend to use low-speed processors. Programmers have had to relegate some transaction processing activity to the background.

- **Middleware and communications problems associated with the client/server architecture.** The lack of connections between PC LANs and data servers can be a real showstopper for users implementing client/server MPP systems. Each time IS has to write a

new interface, the direct cost can be as much as \$150,000 and may delay a project for many months.

Interfaces between servers and legacy mainframes can cost well into hundreds of thousands of dollars to write, especially for high-speed direct channel connections. Find out right up front whether your MPP supplier has a direct channel connect capability to existing mainframes.

- **True parallel versions of major databases are in their infancy.** At this point, many users are stuck having to develop applications on lower-performance, nonparallel versions. For instance, Oracle Corp.'s Oracle 7.0 is not a true parallel database, and although Release 7.1 reportedly offers full parallel query capabilities, most MPP

suppliers still have beta versions running in test mode only. Sybase, Inc. has not released a true parallel version of its product, but the database is said to be scalable.

- **Relational database technology has a tough time with multitable joins.** Efficiency is a key problem for most relational databases when handling many table joins. In fact, many-way joins involving, say, eight-way tables are simply impossible even on the fastest hardware; in these cases, performance can slow from seconds or minutes to hours or days.

This inability of relational to handle multiple joins is problematic because the key MPP application — decision support inquiries — requires lots of joins.

MPP suppliers are working around relational's constraints by supplying query decomposers

that automatically break SQL programs into parallel pieces that are executed separately. The results are merged at the end.

While the decomposer can speed up some queries tenfold, relational database management systems' limits on multitable joins curtail the promise of free-format data access. The IS staff may still have to write many inquiries as standardized reports.

- **Some MPP machine architectures are vulnerable to a single point of failure.** These architectures trade off reliability for performance gains. Certain sites with such architectures have reported a mean time between failure of anywhere between seven and 24 hours.

MPP buy (the numbers)

Sites are waiting a while to buy MPP because it takes that long to evaluate such a major purchase. In a survey of 196 commercial sites,

16.3% 5.1%

have investigated MPP.

62.5%
say MPP's
price/performance
is what led them to
consider the
technology

14.2
months before
buying.

Source: International Data Corp., Framingham, Mass.

Price/performance?

In a test situation, MPP systems have run at roughly twice the speed of the most powerful mainframes at about a quarter of the cost for hardware and software.

For instance, in a Transaction Processing Council benchmark (TPC-B), a 64-processor NCube machine ran the Oracle Corp. Parallel Server database at 1,073 transactions per second with a cost of \$2,500 per transaction. Other vendors have gotten similar results.

Transaction speed reportedly increases linearly as you scale up the number of processors, I/O channels and disk drives.

Real-world thinking

But keep in mind that in the real world, the speed you get depends significantly on the nature of the work performed.

At this point, gains are better for decision support queries than on-line transaction processing.

It may not be cost-effective, for instance, to run a purpose-specific, on-line marketing database with 45G bytes of data without a high-performance database server. MPP's price/performance benefits also make sense for smaller relational database applications in factories, such as those applications used for on-line materials tracking and analysis that run anywhere from 10G to 40G bytes. These are only cost-effective using a high-performance parallel server.

MPP offers savings over mainframes in the areas of power consumption and system housing requirements. However, I have not yet seen price/performance comparisons that take into account all factors as a whole — system reliability, power consumption, system housing requirements, application and system software costs, data center administration and maintenance overhead, retraining and systems integration costs and so forth.

What is MPP's future?

Watch these MPP developments in the '90s:

- Work is under way to incorporate object-oriented programming capabilities into the MPP environment.
- MPP needs an efficient relational database capable of handling many more table joins than is now possible.

The answer to the call for an efficient database, however, may not have anything to do with the relational model at all. New database technologies in development — with multimedia and imaging at the core — may take greater advantage of MPP architecture.

Hypertext, neural networking and ad-

vanced image management techniques are being incorporated into existing database technology, enabling users to do tasks such as search large databases for patterns or find matches seamlessly across text and database records.

- MPP will benefit from advances that will let systems store data as an unstructured pile with "threads" for access.

Such a pile-and-thread setup will enable less rigid storage structures, which help get around relational's multitable join limitations.

- Users want stable highly parallel versions of their databases on the major MPP hardware platforms. I don't think

we'll see that happen until well into 1994.

All these future technical hot spots, however, will pale in comparison to the total sea-change that will happen to the information systems staff. Developers won't be wedged between the mainframe's glacier-like development environments and individual users' fragmented demands. Instead, they will consult with users without losing control of the systems environment.

Boughton is a New York consultant concentrating on MPP. He is collaborating on a book on MPP and the role of the chief information officer.

Computer Careers

What the heck is a relationship manager?

By Howard Dresner

If you're an application developer or database administrator looking for a change, there's hope: An emerging role for information systems professionals is taking shape.

The people who fill this new role will be involved in getting corporate data — previously locked away in legacy systems or dispersed on many platforms throughout the firm — into the hands of managers who need to analyze it.

Until now, financial analysts and experts in operations research were the ones who downloaded and analyzed financial, sales, human resources and other data. But in today's ferociously competitive environment, managers and end users need direct access to this information. It's their only hope of making quick and accurate decisions to keep up with competitors.

Managing resources

In their effort to better manage their resources, many companies today have begun to use business intelligence software. These products range from low-end query and report tools to advanced decision-support tools up to executive information systems.

These types of tools enable users to explore information from internal and external sources, help anticipate future

trends and accurately set business goals.

But gaining access to corporate data is not as easy as buying a tool. Specialists are needed who can gather

er, prepare and distribute the data as well as develop the applications that manage the data. While many companies are performing these tasks on an ad hoc basis, IS roles are being formalized. Here is your chance to get a head start.

► **Business application specialist/relationship manager:** The business application specialist acts as a liaison between the business unit and the IS department. Also known as an account executive, this person works on a team to develop the business intelligence applications.

The specialist works with users to pin down information requirements in advance, making sure that business and user needs are met. Once the data requirements are understood, a prototype is developed.

The best candidates for this role come directly from the business unit. If someone on the IS staff wanted this position, he would need to learn the critical business issues.

► **Database preparation/distribution specialist:** This is one of the more promising roles for IS staffers. It is essentially a retreaded database administrator position with an emphasis on data warehousing and conditioning.

After a team defines which mission-critical data it needs to access, the database preparation specialist locates, acquires and distributes the data.

Much of the data may be on a number of host systems, application databases and file systems; therefore, good investigative skills are required. If the data is owned by an unrelated organization, the database specialist may find himself negotiating for it.

The data conditioning part of the job includes translating coded fields into intelligible data, homogenizing join fields, deleting irrelevant columns and removing redundant data. When clean, it is downloaded to users' servers.

► **Business intelligence modeling/statistics consultant:** The statistics

consultant assists the business application specialist in building complex modeling applications, using sophisticated forecasting techniques and inferential statistics. He spends most of his time analyzing the data and determining how to best present it to users.

Often this individual can be recruited from the ranks of former, dedicated information analysts who are used to analyzing data, applying statistics and models and churning out reports.

Dresner is a program director at Gartner Group, Inc. in Stamford, Conn.

Emerging roles

Business application specialist/relationship manager

Role: To work with users to prototype business intelligence applications.

Skills: • End-user and business experience.
• Experience working with people in various disciplines.
• Aptitude in business intelligence fourth-generation languages, and modeling techniques.

Database preparation/distribution specialist

Role: To locate, negotiate access to, extract, prepare and distribute data.

Skills: • Strong database experience including SQL, nonrelational databases and file systems.
• Strong understanding of business relationships of data, techniques and tools for merging and cleansing data.
• Training in data preparation tools and business intelligence data structures and dictionaries.

Business intelligence modeling/statistics consultant

Role: To assist business application specialists in building very complex modeling applications.

Skills: • Expertise in operations research, statistics and modeling techniques.
• Training in business intelligence fourth-generation language tools and modeling capabilities.

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MAKING THE GRADE

By Rob Williamson

Tips for certification test takers

Network professionals wanting to increase their net worth are looking into technical certifications. Since the inception of Novell, Inc.'s Certified NetWare Engineer (CNE) program in 1990, more than 26,000 CNEs have been awarded.

Preparation for these exams is not cheap, however. At \$85 per test and even more for books and class time, costs are steep, especially with no money-back guarantees. Even so, there are ways to increase the odds of passing.

Novell offers three certification designations: Certified NetWare Administrator (CNA), Certified NetWare Engineer (CNE) and Enterprise Certified NetWare Engineer (ECNE).

A CNA primarily handles network administration and is responsible for tasks such as adding and deleting users, maintaining security, configuring printers, backing up servers and creating log-in scripts.

Each NetWare version requires a separate CNA certification. When preparing, you may want to spend more time on areas that do not fall into your daily network administration duties. Problem test areas include questions on handling memory in a networked environment and printing and capturing commands.

Novell's CNA courses include NetWare System Management, which features NetWare basics, security and customization of the environment; and NetWare Advanced System Management, which teaches network performance optimization and protocol support.

If you administer a Novell network already, you may not need these classes to pass the test. If you are unsure, Novell offers an assessment disk that helps gauge knowledge and provides sample test questions. The same information can also be downloaded from CompuServe.

The next certification level is a CNE, which focuses on hardware and software. CNEs cover operating system installation, network changes and expansion, wiring topology and troubleshooting. Again, a separate CNE certification is required for each NetWare version.

Test takers may find the questions on

CNE protocols particularly challenging if they are unfamiliar with mainframe technology. The protocol coverage consists mostly of mainframe concepts and terms and requires knowledge about protocols such as Open Systems Interconnect and SNA.

Put to the test

Novell requires CNEs to pass seven proficiency tests. While there is no required order, Novell recommends the following path to build upon the knowledge and skills learned: DOS/PC Concepts for NetWare Users, NetWare (2.2, 3.11, 4.0) System Manager, NetWare (2.2, 3.11, 4.0) Advanced System Manager or Advanced Administration, Networking Technologies, NetWare Service and Support and

two electives. You can contact the CNE Professional Association for suggestions on which path to take. Its telephone number is (801) 429-7227.

The most specialized certification from Novell is the ECNE, which concentrates on issues such as interfacing networks, gateways, TCP/IP and internetworking. To become an ECNE, you need 19 core operating systems and elective credits, many of which can be attained through the CNE certification process. The advantage of going for the ECNE is you can take courses that interest you.

There are several ways to prepare for testing, including courses, self-study videotapes and computer-based training. Classroom courses range from \$300 to \$400 per person. Multimedia training ranges from \$295 to \$1,195 per course.

Williamson is the product manager for client/server and networking for the National Education and Training Group in Naperville, Ill.

TIPS FOR TESTERS:

- Plan on taking the tests within two weeks of completing courses.
- Don't cram. Retention rates drop significantly when you do.
- Don't take two or three tests in one day.
- If you decide to try out Novell, Inc.'s assessment disk, you should be able to answer 90% of the questions correctly to be in passing range on the real tests.

James Aiello, manager of the product test center, National Education Training Group in Naperville, Ill., has taken and passed three of the required seven tests for the CNE.

He suggests:

Read the books provided by Novell. In many cases, the phrasing of the test questions is the same. They're very expensive, however.

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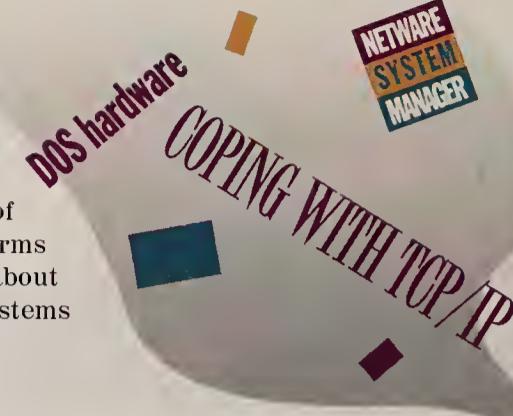
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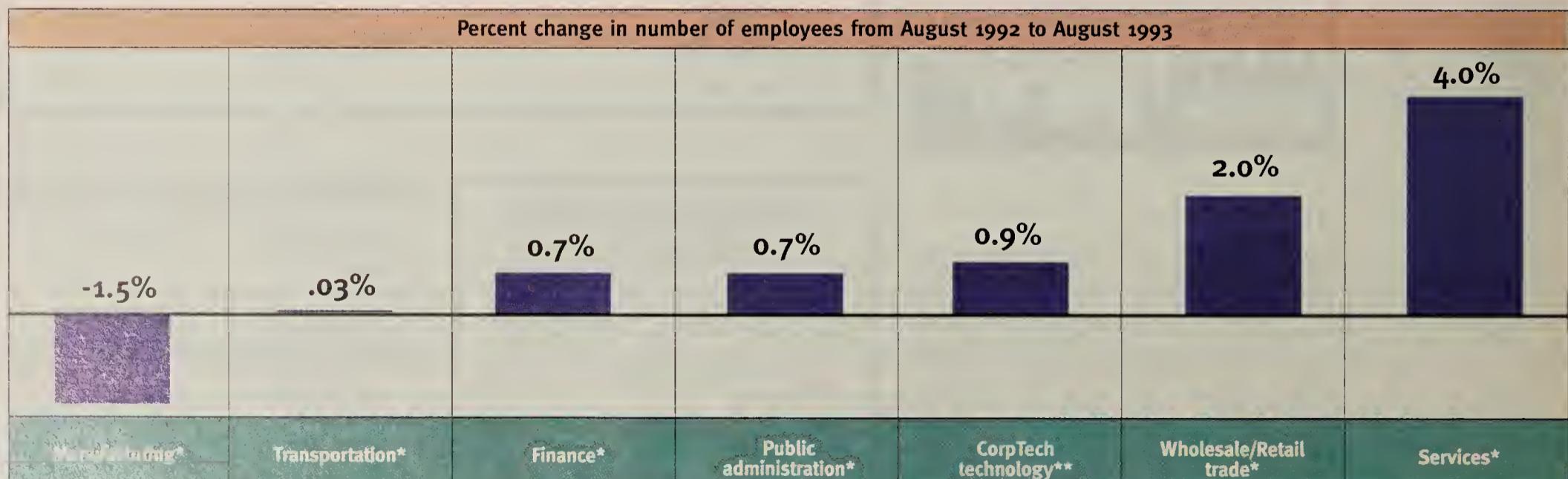
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To Build or Not to Build

CUSTOMIZING PACKAGED APPLICATIONS RATHER THAN BUILDING FROM SCRATCH MAY SAVE ON DEVELOPMENT RESOURCES BUT ALSO PRESENTS NEW INTEGRATION CHALLENGES

By David Baum

Rising software development costs are causing more and more companies to question whether to build or buy software.

While there are no cut-and-dried answers, experts agree on a strong trend toward customizing packaged solutions.

"If you look at all the types of software used, the commodity level is slowly moving up," observes John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston. More problems are becoming better understood and are being solved by packaged solutions.

"So don't assume your needs are too specialized to lend themselves to an off-the-shelf solution until you've taken a good look around," Rymer adds.

Building from scratch

Most companies still build applications from scratch when it will clearly bring a competitive advantage or when a truly unique problem needs automating.

But even when developers decide they need to build a system themselves, they can usually find packaged components as a starting point, says Donna Morea, a vice president at American Management Systems, Inc. in Fairfax, Va. "Packaged applications and software components for PCs have especially proliferated."

"Years ago, packaged software was all proprietary," adds Nigel Smith, a systems analyst at Shell Oil Co. in Houston. "But so much of it now utilizes open interfaces, making it easy to integrate

these packages with other applications at your shop."

Often, the real challenge is getting management to buy into these new software strategies, Smith adds.

While packaged solutions may save on programming resources, there are plenty of other costs to watch. For instance, organizations still wrestle with database integration issues, such as providing connectivity between centralized corporate data and local front-end applica-

application suites, saving the time developers spend tying disparate applications into a cohesive environment, explains John Murphy, president of Metro Computing in Gibbsboro, N.J.

Application suites

Memory and disk requirements for suites can be substantial, however, often forcing hardware upgrades. Networks may also need beefing up to handle the new workgroup computing habits encouraged by application suites such as shared editing sessions and the exchange of compound documents.

The real cost for packaged software, however, is upgrades. According to Murphy, the typical PC program is updated about once every 1.4 years. "For a five-year outlay, you can plan to spend two to three times the initial purchase price just for upgrade costs."

Murphy recommends not taking every update, unless it represents a substantial productivity increase. "Sometimes

all you're paying for is a few new bells and whistles," Murphy says.

In the future

However, there is something to look forward to. In the not too distant future, virtually all applications will be made up of prefabricated parts snapped together from object-oriented class libraries, predicts Dan

Shafer, editor of the "Inventive User Letter" and president of Graphic User Interfaces, Inc. in Redwood City, Calif.

The issue for companies will no longer be "to build or to buy" but "where to find the right parts and how best to snap them together."

"You will buy a set of class libraries

PURCHASING AND INTEGRATING PACKAGED SOFTWARE— THINGS YOU SHOULD KNOW

Does the package meet at least 50% of your business requirements out of the box?

How much customization is needed to implement the remaining requirements?

Will the vendor work with you to customize the product?

Is the vendor open to adding your improvements to the product line?

Source: Donna Morea, vice president, American Management Systems, Fairfax, Va.

that answers 85% to 90% of your needs," Shafer says. "The rest of the application might be constructed from packaged software components or written by hand."

Shafer points to the burgeoning market for add-on modules created by Microsoft Corp.'s Visual Basic. The new tools and programming techniques will be even more sophisticated, however.

Most programming to date has been similar to designing and building completely customized houses, with even the bathroom fixtures specially made instead of ordered off-the-shelf.

But programming with tomorrow's object-oriented class libraries and add-on modules is analogous to ordering entire rooms as units and joining them together with minimal effort, according to Shafer.

Once written, these self-contained, reusable chunks of software code can be mixed and matched by programmers to create new applications without having to start from scratch each time.

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

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Friday Stock Ticker

Gainers

Losers

Percent

GROUP I SOFTWARE	31.3	ZILOG INC.	-23.5
MICROCOM INC.	26.1	SPINNAKER SOFTWARE	-20.0
CAMBEX CORP.	20.0	PEOPLESOFT	-19.5
ANACOMP INC.	14.8	WEITEK	-18.5
INACOM CORP.	13.3	LATTICE SEMICONDUCTOR	-17.7
NORTHERN TELECOM LTD.	10.2	CENTIGRAM COMMUNICATIONS	-17.4
KENDALL SQUARE RESEARCH	9.3	WORDSTAR	-16.7
CONNER PERIPHERALS	7.8	DATA RACE INC.	-16.0

Dollar

3M CORP	3.00	NEWBRIDGE NETWORKS CORP.	-9.25
NORTHERN TELECOM LTD.	2.75	ZILOG INC.	-9.00
GROUP I SOFTWARE	2.50	DSCCOMMUNICATIONS	-8.00
AUTODESK INC.	2.13	PEOPLESOFT	-7.00
INACOM CORP.	2.00	MOTOROLA INC.	-6.75
OCTEL COMMUNICATIONS CORP.	1.88	MICRON TECHNOLOGY	-6.13
APPLE COMPUTER INC.	1.50	TEXAS INSTRUMENTS	-5.88
ITT CORP.	1.25	CENTIGRAM COMMUNICATIONS	-5.75

THE MARKET EVIDENTLY PUMMELED NEWBRIDGE NETWORKS, INC. LAST WEEK FOR MEETING EXPECTATIONS BUT FAILING TO EXCEED THEM. NEWBRIDGE ANNOUNCED FINANCIAL RESULTS IN LINE WITH ANALYSTS' PREDICTIONS, BUT THE STOCK FELL OVER CONCERN THAT EARNINGS MOMENTUM IS SLOWING.

Industry Almanac

Riding the cycle

Strong starts and summer slumps characterize the typical yearly pattern for semiconductor stocks.

Chip stocks are often referred to as cyclical stocks because the semiconductor business usually follows both seasonal and macroeconomic cycles, said Gerald Fleming, vice president at Fahnestock/Christopher in New York.

"There is a seasonal pattern where people tend to order fairly heavily at the beginning of the year. Then it slows down as you head into summer, then starts to pick up again at the end of the year," Fleming said. "In terms of the longer cycle, it's tied to the economic cycle because all electronic devices are driven by consumer spending."

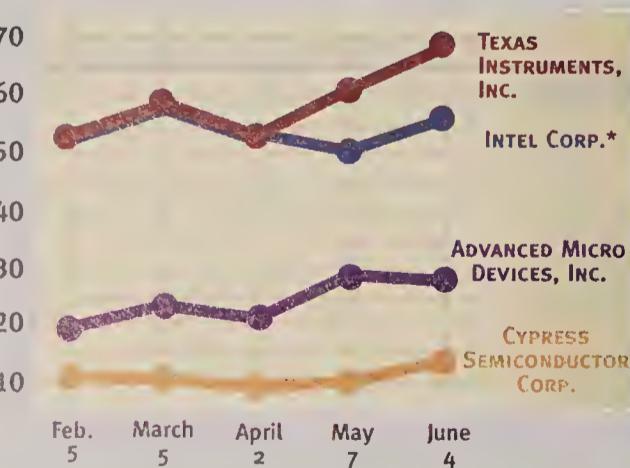
This year, though, semiconductor issues bulled their way through the summer with little drop-off (see chart). Many of the stocks reached new peaks in the September time frame, becoming "somewhat overheated" because the traditional summer slump never materialized to keep valuations modest, according to an industry perspectives report by Lawrence Borgman at Josephthal, Lyon & Ross, Inc.

As a result, Intel Corp. (INTC), Advanced Micro Devices, Inc. (AMD), National Semiconductor Corp. (NSM) and other issues have fallen back significantly in the past two months.

—Derek Slater

Summertime blues

Semiconductor stocks weathered a slight slump in April and May this year but were already on the rise again by June



*Intel's share price is adjusted to reflect a subsequent 2-for-1 stock split

EXCH 52-WEEK RANGE Nov. 19 Wk Net Wk Pct
3PM CHANGE CHANGE

EXCH 52-WEEK RANGE Nov. 19 Wk Net Wk Pct
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Computer Industry

Database market

Briefs

HP results rise

Hewlett-Packard Co.'s fiscal fourth-quarter profits soared 87% to \$298 million, and revenue rose 32% to \$5.7 billion. The strong fourth quarter boosted the Palo Alto, Calif., firm's fiscal 1993 earnings to \$1.17 billion, a 114% increase from the year-earlier period, on revenue of \$20.3 billion, a 24% climb from 1992. While orders are strong, HP cautions that inventories and the cost of sales are too high.

Wang posts profit

Wang Laboratories, Inc. reported an \$11.9 million first-quarter operating profit, ending a string of five straight operating losses. Accounting procedures related to Wang's emergence from Chapter 11 bankruptcy protection boosted net income in the quarter ended Sept. 30 to \$306.3 million. Revenue declined 41% in the period to \$210.9 million, reflecting Wang's shift from hardware to software.

Sterling takes a hit

Sterling Software, Inc. reported a \$48.6 million fourth-quarter loss, caused primarily by a restructuring charge to cover its acquisition of System Center, Inc. Revenue in the period ended Sept. 30 increased 5% to \$110.7 million, the Dallas software developer said. For the year, Sterling lost \$38.6 million; revenue increased 9% to \$411.8 million.

SHORT TAKES Sapiens International Corp. in Cary, N.C., posted third-quarter net profits of \$2.1 million on revenue of \$15.2 million....

Ten-year-old Spectrum Information Technologies, Inc. in Manhasset, N.Y., reported second-quarter net earnings of \$646,000—the first time it has strung together consecutive profitable periods—on revenue of \$24.4 million. The company also agreed to acquire C.P.U., Inc., an \$18 million, Rochester, N.Y., systems integrator.

Relational threat stalks object DBMS makers

By Kim S. Nash

■ Already struggling object-oriented database vendors will soon face the added risk of being stamped out completely as relational database companies such as Sybase, Inc. and Oracle Corp. talk up plans to "objectize" their products in the next year.

Objectivity, Inc., Versant Object Technology Corp. and three or four other small, privately held firms accounted for the bulk of the \$32 million in object-oriented sales last year (see chart). The market is expected to double in 1993, according to International Data Corp. (IDC) in Framingham, Mass., but even that kind of growth may not keep shaky object-oriented vendors afloat, observers said.

"It's questionable whether the market can expand fast enough for all to survive," said Jacob Stein, an independent object-oriented database consultant in Oakland, Calif.

No profits

The major players are half a decade old, and with one possible exception, they are not making any money, according to analysts. No firm sells more than \$10 million worth of products per year, with each of the Top 5 selling an average of \$4 million to \$7 million worth, according to consensus estimates. With that in mind, Stein predicted that at least one or two firms will either be acquired or will fold during the next 12 to 18 months.

Object-oriented database vendors find themselves in a catch-22 of sorts. Much as it was with artificial intelligence, there are plenty of ideas for using object database technology but few that match immediate business needs. Without those sales, providers weaken. In turn, information systems managers with an interest are loath to buy from such weak players.

Compounding that issue are tantalizing proclamations about future object plans from stronger, more established relational database companies, which gives IS yet another reason to wait.

For example, mainstream IS departments—as opposed to specialized technical and engineering groups—accounted for just 4% of the \$32 million object databases market, according to Steve McClure, an analyst at IDC. The rest went to people

working on complex niche applications such as geographic information systems and intricate systems required to monitor large phone and data networks.

New ways of thinking

While object systems are expected to enable as-yet undiscovered programs, "it's a hard sell in some ways because you have to get people thinking in new ways," said Dave Banks, president of Versant.

Meanwhile, there is little need for an object-oriented system to store and send the data that traditional business applications produce, analysts, vendors and users said.

But that's not the point of object-oriented databases by and large, according to proponents.

A major difference between relational databases and their object-oriented cousins is that the latter were built to handle complex models that do not sit in rows and tables.

For a relational database to accommodate a

model, the system would have to break the model down into small pieces, each with coordinates that could be plotted on a grid. Cells within tables would hold those coordinates. When a user wanted to view the model, he would have to write a complex query asking the database to reconstruct it. That involves searching for all the information pertaining to the model, probably by way of several joins. The task would take a fair amount of time to process.

Compare this to the way an object-oriented system would fetch the same model. The database uses pointers to locate the model, which it stores intact. The process could be 100 times faster, McClure said.

Tough transitions

Some object-oriented vendors are trying to break out beyond the scientific and engineering realms, but several factors may conspire to rough up the transition, includ-

ing the following:

- No uniform way to talk to object-oriented databases; each product has its own language for querying the database. Analysts said the market needs a standard that is similar to SQL in the relational world.
- Lack of off-the-shelf third-party software packages for object databases.
- Few links between object-oriented databases and relational databases.

Building it up

IBM bought an estimated 20% stake in Object Design, Inc. in April for about \$27 million. By mid-1994, IBM plans to build Object Design's DBMS into AD/Platform, a reincarnated version of IBM's mainframe-based AD/Cycle application development environment.

For example, some vendors, such as Montage Software, Inc. and UniSQL, Inc., are taking a hybrid approach to the object vs. relational issue. Montage touts its flagship database as an "object relational" system that lets users store, query and manipulate objects—video, blueprints, three-dimensional drawings, etc.—using relational techniques such as SQL.

The goal is to let users hang on to relational applications and databases by gradually introducing object technology into the IS shop, said Michael Stonebraker, who co-founded 15-month-old Montage with venture capitalist Gary Morganthalier. Such combination object relational systems hold promise, according to McClure.

Adding two, getting one

There are users waiting for that marriage. Take Jay Parekh, senior manager of software development at BT North America, Inc. The San Jose, Calif., division of BT runs the world's biggest data network, formerly known as Tymnet. Global firms such as J.P. Morgan and Co., Holiday Inns, Inc. and Pittman Moore are customers. The system that manages that massive network runs against Versant's object-oriented product.

Although Parekh said he is quite pleased with object technology, he said he will not invest further in either object-oriented or relational products until vendors come up with a solid way to get the two different systems working together.

The relational answer is to tack object extensions onto relational database management systems. Although such a move would not put relational databases on par with object-oriented systems, it would buy them mind share, observers agreed. That strategy could hurt object-oriented sales.

Hence, the main challenge for object database makers during the next year or so is to cultivate enough mainstream IS users who will be able to stump for object-oriented technology when relational firms start to push their own.



Gain is the name

Objectivity's object-oriented database lives at the heart of Sybase's multimedia application development tool set, dubbed Gain Momentum. Gain is part of a broader object-oriented product line Sybase unveiled in August.

Wysiwyg

What is your favorite restaurant in the world?

"Normally, I don't think about the food I eat and whether it is good or bad. However, when I ate at Moulin de Mougins in France, the food was absolutely incredible. . . . I have never eaten a meal so wonderful before or since."

—RICHARD RABINS, CO-CHAIRMAN,
ALPHA SOFTWARE CORP.

"On the last night of a European product tour, we went out to dinner at a loud yet elegant restaurant called Sal n Pepe. After several days of meals on the run and airport food, that Italian restaurant in London really made an impression on me."

—RON ZAMBONINI, PRESIDENT AND COO,
COGNOS CORP.

—And here's a recipe you can try for your holiday table

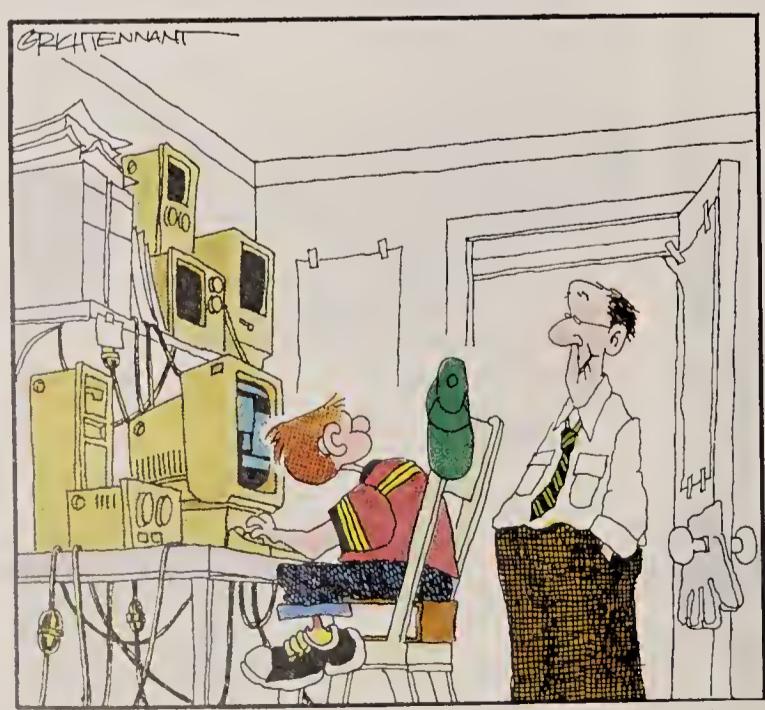
Thanksgiving Cranberry Corel-ish

2 cups fresh cranberries
1 apple, unpeeled
2 oranges, peeled and seeded
1 8-oz. can crushed pineapple, undrained
1 cup sugar
1 cup chopped pecans

In food processor, chop cranberries and place in large bowl. Chop apple and oranges, adding to same bowl. Add remaining ingredients. Mix and chill.

Fat reducer: Reduce the nuts to $\frac{1}{2}$ cup or omit altogether.

Recipe taken from *Quick Bytes: Computer Lover's Cookbook* by Diane Pfeifer (Strawberry Patch, Atlanta). Illustrations by Fran O'Neill



"I suppose this all has something to do with THE NEW MATH."

Inside Lines

Maybe now that it's out in the open . . .

Daniel Gasteiger from the Gasteiger & Delonas consulting firm in Boston reports that Lotus' 1-2-3 for Windows Release 4 may not scale as well as promised. He says 1-2-3 has been crashing when he employs the File Combine operation on spreadsheets that have more than 6M bytes of data. While most users won't create 6M-byte spreadsheets, the rolling up on several spreadsheets from multiple users in a workgroup into a single master file will push that limit. Lotus executives last week said they have yet to encounter that problem but are looking into it.

Trying harder

Hewlett-Packard last week quietly outlined for customers a host of forthcoming 3000 products, including enhanced backup, patching and subsystem upgrades. HP committed to a May delivery of the modified version of the MPE/iX operating system, called 5.0, and to a September shipment of the full version. HP is mindful that its 55,000 HP 3000 sites helped it reach last week's milestone: The \$20.3 billion company reported \$15.5 million in computer business [see story page 119], thereby passing Digital as the No. 2 industry vendor.

Pumping up CASE

Meanwhile, HP is expected to announce a Cobol version of its Soft-Bench CASE framework next week, a company insider said. Soft-Bench for Cobol will be aimed at mainframers who want to move applications to Unix hardware. The product was designed to keep mainframe code in place but mask it at the user level with a graphical Unix-based interface, the source said.

Something to warm phone company hearts

According to sources, Digital's customer service unit is promising some changes to make it more user-friendly, including less pressure on its telephone support workers to close calls quickly. With some users complaining they were being rushed, Digital will now evaluate its workers more on customer satisfaction than on call volume, the sources said. Longer-term, they added, Digital plans to streamline its service contracts, support on-line updates and integrate its disparate contract administration databases. The moves are expected to be disclosed at the Digital Equipment Computer Users Society (Decus) conference in San Francisco next month.

'And the survey says . . .'

Also at Decus, Digital plans to hand out a survey asking users to list their key buying considerations and then rate the company on how well it is meeting the criteria. Digital officials said they plan to use the feedback to set priorities and goals for an ongoing re-engineering of its customer supply chain. The survey is also part of an effort by Digital to convince users that, for a change, they have its ear.

Dynamic duo

Oracle and Novell are expected to make a joint announcement today that OracleWare is shipping to Netware resellers. The bundle of Oracle's database and either Novell's Netware or UnixWare operating systems was announced in June and will be priced at about \$250 per user, according to Oracle CEO Larry Ellison.

Parting is such sweet sorrow — if you are former Apple Chairman John Sculley. Besides cleaning up when he signed on with Spectrum Information Technologies, Sculley received a severance package worth \$4.1 million, according to a published report. Apple will buy his Silicon Valley home and pay moving expenses to Connecticut. Sculley also gets a cash award of \$1 million, consultant's fees for the next year and immediate vesting of stock options he has not yet earned. And this from a company that was forced to lay off 2,500 people earlier this year in order to "trim the fat." Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

Computer companies today are facing more and more challenges than ever before. Challenges such as the call for superior customer service. Not to mention handling more calls. Which means busier customer service representatives. As well as more busy signals. Bigger problems, smaller profit margins. How can your company provide high-quality customer service at an affordable cost? Companies like Borland, Micro-Sota, DacEasy and Philips Consumer Electronics are doing it with AT&T MultiQuest 900 Service.

Imagine a service that lets your customers select the customer service option that best meets their needs. That's because *MultiQuest* 900 Service can be used in a variety of ways. For example, you can supplement your general inquiry line by opening up a 900 number to provide purely technical support. Customers get the expert help they need quickly and

easily—because the call goes directly to technical support staff. They can even receive faxback instruction sheets via 900 service.

But, just as important as keeping your customers satisfied is keeping your company profitable. AT&T *MultiQuest* 900 Service lets you determine the cost that your customers will pay for each call. Then, AT&T handles billing and collections and forwards the proceeds to you. So you can afford to help more and more people.

With all of these advantages you'll probably want to speak to an AT&T

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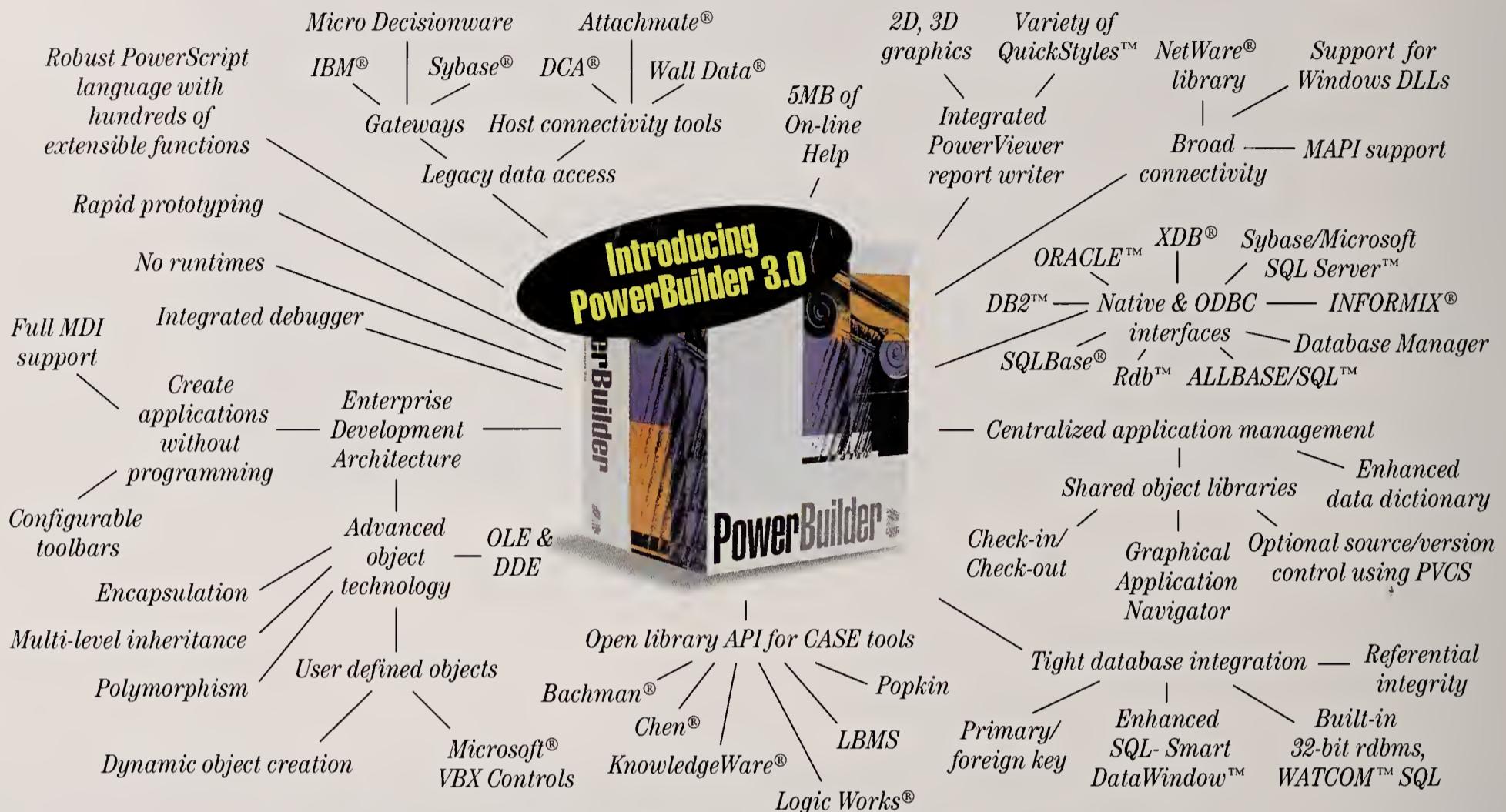
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And with the introduction of PowerBuilder 3.0, now it's even better. More powerful. More graphical. More open. A glance above will give you some idea of what we're talking about.

And there's more. PowerBuilder's success has spawned a whole new suite of products that span the enterprise from IS to end users. Called the Powersoft Enterprise Series, it gives you best-of-breed tools that share Powersoft's Common Object Technology — thus enabling enterprise-wide collaborative development. This represents the first and only true Enterprise Development Architecture, letting IS use object technology to empower end users, for an "object-empowered" enterprise.

PowerBuilder drives the model, letting IS create and manage the use of powerful shared objects — forms, queries,

reports and graphs. Then, using these shared objects, PowerViewer™ lets end users quickly create the business reports and graphs they need. PowerMaker™ delivers full PowerViewer functionality plus its own, built-in, WATCOM SQL database and the tools to develop robust form-based personal client/server applications — *without programming*.

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